

# **WILL CLOSE AIR SUPPORT BE WHERE NEEDED AND WHEN TO SUPPORT OBJECTIVE FORCE OPERATIONS IN 2015?**

**A Monograph  
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## Abstract

### WILL CLOSE AIR SUPPORT BE WHERE NEEDED AND WHEN TO SUPPORT OBJECTIVE FORCE OPERATIONS IN 2015?

by MAJ Bryan K. Luke, U.S. Army, 95 pages.

The United States Army recently released a white paper on *Concepts for the Objective Force*. This force will be capable of simultaneous engagement by air-ground maneuver elements at operational and tactical distances by employing future advanced lift, reconnaissance, and attack aviation supported by both joint fires and suppression of enemy air defenses. The battles, engagements, and major operations of 2015 are expected to occur on non-linear battlefields with friendly forces involved in widely dispersed non-contiguous unit operations. The Objective Force concept is highly dependent on airpower (both transport and attack) to successfully conduct these non-linear and non-contiguous operations. Current airpower doctrine though, is based on a linear battlefield with close, deep, and rear areas. Will this disconnect result in airpower not being where and when it's needed on the battlefield of 2015?

This monograph specifically examines the history, current doctrine, and emerging concepts on how Close Air Support (CAS) is defined, employed, and controlled to determine if CAS will be where it's needed and when to facilitate effective Objective Force operations in 2015. The answer to this question is no unless the definition, doctrine, and integration of CAS with the ground component scheme of maneuver is improved.

To arrive at this conclusion, the monograph first conducts a detailed examination of the history of CAS during the Korean War, Vietnam Conflict, and Desert Storm to discover "why" CAS doctrine has developed along the lines that it has. This endeavor is an attempt to discover the potential implications for CAS doctrine development in the future. Second, the adequacy/suitability of current CAS doctrine is examined by conducting a comparison of Army, Air Force, and joint doctrines to discover potential doctrinal disconnects that may exist. Finally, the feasibility of developing and implementing a joint CAS doctrine by 2015 that recommends an increase in the integration and use of CAS assets with the ground force scheme of maneuver is determined by analyzing the average development times for new doctrine and an examination of service historic, current, and future views on the use of CAS.

A major conclusion of this monograph is that the definition of CAS must account for the use of airpower in close proximity to troops as well as to shape near-term enemy forces that are outside the range of the preponderance of ground weapon systems. To this end, the creation of the term Battlefield Air Support, with Close Air Support and Battlefield Interdiction as its subcomponents, is recommended. Additionally, three potential courses of action (COA) to improve the doctrine and integration of CAS in 2015 are presented. The first COA is focused on making minor modifications to existing doctrine, establishing habitual relationships between Army and Air Force units, and improving CAS training /use for rotary wing aircraft. The second COA advocates the Army assuming the responsibility for CAS missions within ground based indirect artillery ranges. The final COA recommends the integration of fixed wing aircraft units into Objective Force Division Air-Ground Task Forces. These fixed and rotary wing units would be tasked organized into Ground Attack Wings (GAWs) which would be commanded by an airmen or aviator.

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## I. INTRODUCTION

Close Air Support (CAS) has and continues to be a contentious issue between Airmen and ground forces since WWI. Joint Pub (JP) 1-02 defines CAS as “air action by fixed and rotary-wing aircraft against hostile targets which are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces.”<sup>1</sup> What is meant by “close proximity” and “detailed integration” has yet to be defined. Given some of the ambiguity of this definition, Colonel John Warden III, a leading airpower theorist and primary designer of the Desert Storm air campaign, recommends that close air support be defined as “any air operation that theoretically could and would be done by ground forces on their own, if sufficient troops or artillery were available.”<sup>2</sup> Others have recommended that CAS be defined as “any use of air assets short of the Fire Support Coordination Line (FSCL).”<sup>3</sup> Besides the definition, other key issues in the CAS debate have revolved around determining priorities in the employment of airpower, allocation and apportionment of CAS assets, command and control (C2) of CAS systems, and whether a single or multipurpose aircraft is needed for the task.<sup>4</sup>

With the collapse of the Soviet Union and declining military budgets, the role of CAS in future conflicts has once again become a contentious issue between the services. This debate has taken on new significance with the Chief of Staff of the Army announcing in October 1999 his intent to conduct a major initiative to “transform” the Army into a “more strategically responsive, deployable, agile, versatile, lethal, survivable and sustainable force across the entire spectrum of military operations from Major Theater Wars through counter terrorism to Homeland Security.”<sup>5</sup>

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<sup>1</sup> Office of the Chairman, Joint Chiefs of Staff, *Joint Publication 1-02 Joint Terms and Definitions* (Washington, D.C.: United States Government Printing Office, 1995), 99.

<sup>2</sup> John A. Warden III, *The Air Campaign: Planning for Combat* (Lincoln, NE: toExcel Press, 2000), 87.

<sup>3</sup> David Keithly, “Revamping Close Air Support,” *Military Review* (March-April 2000), 16.

<sup>4</sup> Michael Lewis, *LTG Ned Almond, USA: A Ground Commander’s Conflicting View with Airmen over CAS Doctrine and Employment* (Maxwell AFB, AL: School of Advanced Aerospace Studies, 1997), 5.

<sup>5</sup> US Army Deputy Chief of Staff for Doctrine, “Concepts for the Objective Force”, *Army White paper on the Objective Force* (Fort Monroe: US Army Training and Doctrine Command, Nov 2001), iv.

In November 2001, the Army published a White Paper describing the broad capabilities, concepts, and core technologies needed to enable operations of the Army's transformed "Objective Force." A significant capability of Objective Force units will be to "deploy rapidly to a theater of operations and immediately be capable of conducting simultaneous, distributed and continuous combined arms, air-ground operations, day and night in open, close, complex, and all other terrain conditions throughout the battlespace."<sup>6</sup> Objective force units conducting joint and combined operations must "*see first, understand first, act first and finish decisively* at the strategic, operational, and tactical levels of an operation."<sup>7</sup> Given the reliance of the Objective Force on advanced joint assets for sensing and destroying enemy forces in both decisive and shaping operations, the doctrine, training, and equipment of the joint force will be more important to the Army than ever before.<sup>8</sup>

*This monograph examines the history, current doctrine, and emerging concepts on how close air support is defined, employed, and controlled to determine if CAS will be where needed and when to facilitate Army Objective Force operations in 2015.* In other words, will the joint CAS doctrine of 2015 match the expected requirements and capabilities of the Army's Objective Force? The analysis presented in this paper will show that the current answer to this question is no unless changes are made to the current joint definition of CAS, the doctrinal emphasis on its immediate battlefield effects, and how CAS is integrated into the ground component scheme of maneuver. The monograph addresses this issues in four major sections.

The first section outlines the operational environment expected in 2015 and the key Army and Joint capabilities that will be required for effective operations. Specifically, the Objective Force is expected to face an enemy in 2015 that will operate with a mixture of legacy and

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<sup>6</sup> US Army Deputy Chief of Staff for Doctrine, *Draft TRADOC Pamphlet 525-3-0 United States Objective Force Operational and Organizational Concept*, (Fort Monroe: US Army Training and Doctrine Command, Nov 2001), 4.

<sup>7</sup> Ibid. Decisive operations are those operations that conclusively determine the outcome of major operations, battles, and engagements.

<sup>8</sup> Shaping Operations are used to create or preserve opportunities for the success of the decisive operation (i.e. they set the conditions for the success of the decisive operation).

advanced precision weapon systems. This force will disperse its units into urban areas and complex terrain in an attempt to negate the joint firepower capabilities of U.S. forces, delay their destruction as long as possible, and cause extensive U.S. casualties in the hopes of a favorable negotiated settlement. To make the enemy vulnerable in these situations, the joint force will be required conduct both precision fires and dominant maneuver at operational as well as tactical distances. The vertical envelopment of Army Objective Forces to seize/destroy/neutralize key terrain, facilities, infrastructure, or cities that are critical to the enemy's ability for continued resistance will force the enemy to move and mass, thus making him vulnerable to U.S. joint precision fires.

The second section of this monograph provides a brief analysis of the history and equipment that has facilitated the accomplishment of the CAS mission. This section takes a detailed look at CAS use and control during the Korean War, Vietnam, and Desert Storm.<sup>9</sup> The purpose of this analysis is to discover "why" CAS doctrine has developed along the lines that it has in order to identify potential implications for CAS doctrine development in the future. Additionally, the historical analysis looks for examples of CAS strategy-to-doctrine-to-capability mismatches during these conflicts to determine the severity of the disconnect on joint operations and then identify how the services were able to overcome these disconnects, if at all.

The third section conducts an assessment of current and future CAS doctrine. Specifically, this section examines the feasibility, suitability, and acceptability of current and expected joint CAS doctrine for facilitating Objective Force operations in 2015. To determine the adequacy/suitability of current CAS doctrine, a comparison of Army, Air Force, and joint doctrines and the current definition of CAS is accomplished to discover potential doctrinal disconnects. Additionally, to discover disconnects between current doctrine and reality, an examination of how CAS is actually being utilized and controlled in real-world events and in

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<sup>9</sup> The majority of the historical information is referenced from Franklin B. Cooling, Case Studies in the Development of Close Air Support (Office of Air Force History, US Air Force, 1990). If you are interested in more detailed information on the history of CAS from WWI to Vietnam, I highly recommend you review this book.

Army/Joint exercises is conducted. The level of acceptability of the services to revise CAS doctrine is determined by a review of differing service cultures/doctrinal publications (past and present) and of Army and Air Force concepts for CAS in 2015.<sup>10</sup> Finally, to determine the feasibility of publishing revised CAS doctrine in sufficient time to affect joint CAS capabilities by 2015, a review of the time required to revise and publish individual service and joint doctrine manuals is presented.

The fourth section is a synthesis of the previous three sections and provides conclusions on the viability of CAS doctrine to facilitate effective Objective Force operations. This section also makes recommendations for modifying the current CAS definition in order to better reflect current and future CAS uses. Finally, this section makes recommendations on changes to the organization, employment methods, and control of close air support that will facilitate effective Joint and Army Objective Force operations in 2015.

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<sup>10</sup> Specifically, the acceptability of revised doctrine that may require a greater degree of integration and employment of CAS assets in support of ground force operations.



## II. THE ARMY'S OBJECTIVE FORCE

### The Operational Environment of 2015

What type of battlefield and enemy will the Objective Force face in 2015? Will it be a repeat of the situations in Vietnam, Desert Storm, or the current Afghan campaign? The answer to this question is yes and no. We can expect future wars to contain some of the characteristics of previous conflicts, but no two conflicts have ever been the same. Just as the enemy, terrain, and political situations were different in Vietnam, Desert Storm, and in Afghanistan, they will also be different in the wars of 2015. The difficult part of prediction is to determine which characteristics of previous wars may re-emerge in future conflicts and what new features/characteristics we may encounter. With this difficulty in mind, the following paragraphs provide the "expert" view on the possible political situations and enemy capabilities that will be faced by the Objective Force in 2015.<sup>11</sup>

Robert Kaplan, in his book, *The Coming Anarchy*, believes that the future politics of warfare will be those of communal survival, aggravated or caused by environmental scarcity where people are more aware of their differences than similarities.<sup>12</sup> Kaplan points to West Africa as an example of the future of the underdeveloped world. In West Africa, "disease, overpopulation, unprovoked crime, scarcity of resources, refugee migrations, the increasing erosion of nation-states and international borders, the empowerment of private armies, security firms, and international drug cartels have lead to the emergence of a criminal anarchy which is the real "strategic" danger that the U.S. will face from these countries."<sup>13</sup> Kaplan also predicts the spread and intensification of Islam. He states that "a political era marked by scarcer resources, increased cultural sensitivity, unregulated urbanization, and refugee migrations is an

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<sup>11</sup> For the purposes of this paper, an author is considered an "expert" if his or her publication is recommended reading by the Army's School of Advanced Military Studies or the Chief of Staff of the Army.

<sup>12</sup> Robert D. Kaplan, *The Coming Anarchy* (New York, Random House, 2000), 46.

<sup>13</sup> Ibid.

era divinely created for the spread and intensification of Islam.”<sup>14</sup> Kaplan believes that the militant message of Islam message makes it attractive to the “downtrodden” who are prepared to fight for better social conditions and personal security. Samuel Huntington, another noted author on the political and social environment of the future, predicts that wars over the next several decades will be fought more over cultural, ethnic, and religious reasons than environmental or economic ones. In his book *Clash of Civilizations*, he sees increased conflict due to cultural and religious reasons between the Christian West, Islamic Middle East and Africa, Hindu India, and Asiatic China and Japan.<sup>15</sup> Major General (R) Robert Scales, who is a former Army War College Commandant, writes in his collection of essays, *Future Warfare*, that:

Future conflicts will most likely occur along the same geopolitical and cultural fault lines that have separated civilizations for millennia. These historic lines extend across northern and southern Europe, converge in the Balkans, and traverse through the Middle East; continuing beyond Eurasia, turning south toward the Pacific Rim, down the Malay Peninsula and into the Indonesian Archipelago. As in the past, these geopolitical fault lines will continue to witness ethnic, religious, economic, and political confrontation. American involvement will occur whenever its vital national interests intersect with conflict along these tectonic fault lines.<sup>16</sup>

The most serious threat that will likely arise to challenge U.S. interest is from a *transitional state* bent on becoming a regional hegemon.<sup>17</sup> This potential enemy may feature a partially modernized military, specially tailored to counter American technology and enriched with just enough Information Age advancements to seize the initiative. The expectation is that such an adversary will not try to defeat us, but will seek to deter our incursion into a regional crisis, or make our involvement so costly that we withdraw.

The battles of 2015 are expected to be dominated by precision fires.<sup>18</sup> As a result, Armies will be forced to spread over vast distances and divide into ever smaller tactical increments. The historical trend over the last 200 years supports this assertion. Since Napoleon’s

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<sup>14</sup> Ibid., 107.

<sup>15</sup> Samuel P. Huntington, *The Clash of Civilizations* (New York, Simon & Schuster, 1997), 245.

<sup>16</sup> MG Robert H. Scales Jr., *Future Warfare Anthology* (Carlisle Barracks, PA, U.S. Army War College, 1999), 123.

<sup>17</sup> Ibid., 74.

<sup>18</sup> Michael O’Hanlon, *Technological Change and the Future of Warfare* (Washington, D.C.: Brookings Institution Press, 2000), 120; and Scales, *Future Warfare Anthology*, 74.

time, the distance between soldiers has gone from under twenty meters to over two-hundred meters by Desert Storm.<sup>19</sup> To absorb repeated precision strikes with little loss of people or effectiveness, future formations will have to be porous, distributed, and autonomous whenever possible.

As the future battlefield expands, “no amount of precision weaponry will be able to destroy robust formations divided into small increments spread over vast distances.”<sup>20</sup> Therefore to win future non-linear battles at an acceptable cost, U.S. forces will have to employ an *operational offensive-tactical defensive* strategy whereby future Army Objective Forces utilize their superior mobility to place its forces amongst and between the enemy such that he is forced to wither and concede, or to attack in the most disadvantageous circumstances.<sup>21</sup> Due to the fact that the effects of firepower diminish over time, these firepower intensive wars must be won quickly before the weight of the munitions needed to achieve the desired effects exceeds the practical limit of the force to deliver them.

In May 2001, the U.S. Army Training and Doctrine Command (TRADOC) Deputy Chief of Staff for Intelligence (DCSINT) published *The Future Operational Environment* (FOE). This document echoes many of General Scales’s views.<sup>22</sup> The FOE advocates that the longer adversaries can delay an effective US response, the greater their chances for success. If U.S. forces are committed, the enemy will attempt to degrade US force projection, hold initial gains, and extend the conflict while preserving their military capability. Whenever possible, future adversaries will disperse and operate from complex or urban terrain shielded by civilians and man-made structures or the political sanctuaries of neighboring countries.<sup>23</sup> With limited maneuver space, the complex and urban environment precludes mobility operations and largely negates the effects of US long-range weapons, while minimizing enemy engagement ranges. The

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<sup>19</sup> O’Hanlon, *Technological Change and the Future of Warfare*, 122.

<sup>20</sup> Scales, *Future Warfare Anthology*, 108.

<sup>21</sup> Ibid.

<sup>22</sup> Deputy Chief of Staff for Intelligence, *The Future Operational Environment* (Fort Monroe, VA: US Army Training and Doctrine Command, May 2001), 2.

<sup>23</sup> Ibid., 5.

proximity of buildings may even disrupt sophisticated US digital and voice communications further adding to US command and control difficulties. From these sanctuaries, the enemy will attempt to attack US forces with their own precision strike systems and mobile formations to demonstrate US vulnerability, create casualties, or to degrade or destroy specific capabilities.

To summarize, the operational environment that Objective Forces will face in 2015 is likely to consist of urban and/or complex terrain where the enemy is dispersed as much as possible to negate the firepower of US weapon systems. Therefore, the battles, engagements, and major operations of 2015 are expected to occur on non-linear battlefields with friendly forces involved in widely dispersed non-contiguous unit operations. The enemy will not be a “peer competitor” economically or militarily of the U.S. Instead, he will be a regional hegemon utilizing a mix of legacy and niche advanced technologies to defeat specific aspects of U.S. military capabilities. He will most likely have access to advanced air defense systems, precision munitions, and reconnaissance capabilities, thereby making US forces more vulnerable to enemy fires and less able to strategically and operationally surprise enemy governments/forces. The ability to conduct full-spectrum operations will be especially important when the Objective Force intervenes against failed states or where there is resource scarcity. In these environments, humanitarian issues may dominate operations and private, international, criminal, and non-governmental organizations will be prevalent on the battlefield.

## **Objective Force Capabilities / Requirements**

The Army’s Objective Force is being designed to provide a decisive land force that will participate in all phases of the joint campaign, in all environments, weather and terrain. Current concepts call for the force to be capable of simultaneous engagement by air-ground maneuver elements at operational and tactical distances, employing future advanced lift, reconnaissance, and attack aviation assets, supported by joint fires and suppression of enemy air defenses. In contrast to the phased, attrition-based, linear operations of the past, this approach is focused on

disrupting the integrity of the enemy's battle plan by exposing the entire enemy force to air/ground attack, rather than rolling his forces up sequentially. Superior situational understanding embedded at all levels, based on advanced command, control, computers, communications, and intelligence, surveillance, and reconnaissance (C4ISR) capabilities, will enable ground commanders to operate non-linearly, bypassing what is less important or non-decisive, to focus operations against forces and capabilities most critical to the enemy's defense.<sup>24</sup>

Objective forces will operate on the future battlefield under the control of Units of Employment and Units of Action. The future combat system (FCS) equipped battalion and brigade task force will comprise the fundamental combined arms building block and center of Unit of Action tactical battles and engagements.

Units of Employment (UE) are divisional (tactical) and corps/JTF (operational) command and control echelon within the Objective Force that will be designed to direct major operations and decisive land campaigns in future joint operations.<sup>25</sup> Units of Employment integrate and synchronize Army and joint forces for full spectrum operations. They resource and execute combat operations; designate objectives; coordinate with multi-service, interagency, multinational and non-governmental activities; and employ long range fires, aviation and sustainment. They also provide C4ISR and tactical direction to UAs. The UE is capable of command and control of all Army, joint, and multinational forces. It is organized and designed to fulfill command and control functions as the Army Forces (ARFOR), Joint Force Land Component Command (JFLCC), or the Joint Task Force (JTF). It also has the inherent capacity to interact effectively

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<sup>24</sup> The Objective Force Capabilities/Requirements contained in this section are quoted directly from the following three U.S. Army sources:

1. US Army Deputy Chief of Staff for Doctrine, "Concepts for the Objective Force," *Army White paper on the Objective Force* (Fort Monroe: US Army Training and Doctrine Command (TRADOC), Nov 2001).

2. US Army Deputy Chief of Staff for Doctrine, "Objective Force Unit of Employment Concept," *Abbreviated Text for Objective Force Seminar Wargame* (US Army TRADOC, 17-19 July 2001).

3. US Army Deputy Chief of Staff for Doctrine, *Draft TRADOC Pamphlet 525-3-0 United States Objective Force Operational and Organizational Concept* (Fort Monroe: US Army TRADOC, Nov 2001).

<sup>25</sup> TRADOC, "UE Concept," 12.

with multinational forces as well as with interagency, non-governmental organizations, and private volunteer organizations.<sup>26</sup>

The UE will routinely provide continuous fire support to Unit of Action engagements, incorporating a wide variety of Army and joint capabilities, to ensure freedom of action for maneuver elements, preserve FCS on-board capabilities for use during follow-on objectives, and accelerate tactical decision. The UE will *normally* provide or coordinate fires against targets that extend beyond FCS battalion capabilities in terms of range, desired effects, or volume of fires required.<sup>27</sup> Additionally, the UE will conduct shaping fires/effects to destroy key enemy capabilities, isolate portions of the battlefield, deny the enemy the ability to reinforce or re-synchronize efforts, support preemptive seizure of key terrain, and otherwise shape the battlespace for future operations.

Units of Action (UA) are the tactical warfighting echelons of the Objective Force. They will *see first, understand first, act first and finish decisively as the means to tactical success*. Operations will be characterized by developing situations out of contact; maneuvering to positions of advantage; engaging enemy forces beyond the range of their weapons; destroying them with precision fires; and, as required, by tactical assault at times and places of their choosing.<sup>28</sup> Objective Force Unit of Action Divisions will *ensure freedom of action* for subordinate units through shielding fires and other measures to isolate enemy forces and block reinforcements attempting to disrupt FCS brigade/battalion Red Zone fights.<sup>29</sup> This support enables subordinate maneuver elements to move rapidly from one engagement to the next and maintain a high operational tempo. Division fire assets are primarily responsible for the counter-fire role to support and protect brigade and battalion maneuver. Organic joint linkages will permit

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<sup>26</sup> Ibid., 5.

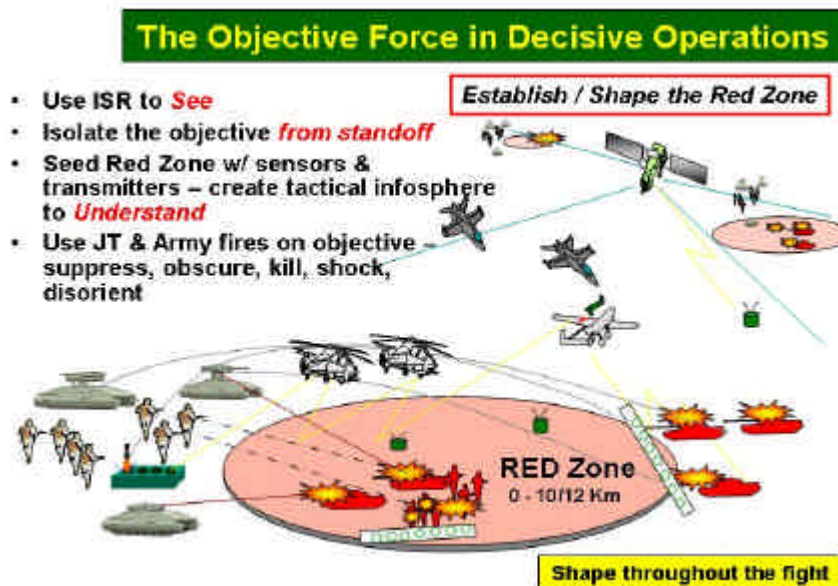
<sup>27</sup> For example, UE assets would normally conduct counterfire, emplace large obstacles, or provide obscuration fires, all of which represent capabilities that will not likely be fully resident within the FCS battalion.

<sup>28</sup> TRADOC, *Objective Force White Paper*, 7.

<sup>29</sup> A Red Zone is defined as that area where the objective force conducts decisive close combat to destroy enemy forces. The force first establishes the Red Zone by employing ISR to see first, then isolates the objective with NLOS and BLOS fires. Information on Red Zone fight taken from *Objective Force Capabilities Briefing* given to SAMS seminar Sep 2001.

the division to coordinate joint support independently or through corps. Like the corps, the division will rotate subordinate UAs through Red Zone engagements and replenishment cycles to maintain continuous tempo and pressure on enemy forces. The expectation is that the division operating radius will extend to 150 km with a planning horizon of approximately 48-72 hours.

The Future Combat System (FCS) equipped battalion will comprise the fundamental combined arms building block and center of tactical actions. The goal is for the FCS combined arms battalion to be capable of organic indirect and direct precision fires to support tactical standoff engagements and close combat assault. However, it is expected that this capability “will be sufficient for the battalion to do some, but not all of the tactical shaping and decisive fires required to obtain conclusive results in close engagements.”<sup>30</sup> Figure 1 provides an example of an FSC unit involved in a Red Zone fight.<sup>31</sup>



In order to enhance the lethality, mobility, and survivability of the dismounted force, assault teams will require soldier systems, robotics, and innovative ground, air, and space sensing capabilities that are linked to FCS firing systems and effectively integrate reinforcing and

<sup>30</sup> TRADOC, “UE Concept,” 23.

<sup>31</sup> TRADOC, *Objective Force Capabilities Briefing* to SAMS Seminar, Sep 2001, slide 28.

complementary fires. These inter-netted capabilities will facilitate fire control and distribution throughout assault operations that allows fires to be precisely shifted and lifted forward of the assault force. A key expectation is that manned and unmanned aerial vehicles (UAVs) will improve situational understanding and function as sensors for mutually supporting long-range fires.<sup>32</sup> Additionally, the Objective Force will employ advanced anti-fratricide measures to facilitate rapid clearance of direct and indirect joint fires.

Corps, Division, and Brigade headquarters will routinely provide continuous fire support to UA battalion and company engagements utilizing a wide variety of Army and joint capabilities. These reinforcing Army and joint units/fires must be available and responsive to provide whatever level and form of support is required to ensure tactical decision by objective force battalions. To facilitate this level of continuous and responsive support, highly integrated and automated fire planning systems and processes that optimize the allocation of internal and external resources, automatically deconflict the targeting process, ensure mutual support between echelons, and achieve maximum effects for resources expended will be needed. Additionally, effective planning and coordination will require near-real time connectivity to organic and joint sensors, effects providers, and joint resources.

The role of the Objective Force attack and reconnaissance helicopters is particularly important in the ability of the Force to accomplish its assigned tasks. Future rotary wing assets (Comanche) are expected to provide “man-in-the-loop deep reconnaissance, early warning, armed escort, route security, and combined arms precision strike in support of ground maneuver.”<sup>33</sup> Objective Force advanced helicopters will direct joint mobile strike operations by employing their own extensive on-board suite of sensors as well as acting as a throughput for joint information sources such as JSTARS, UAVs, and other fixed and rotary wing aircraft. Overall, the multifunctional capabilities of the Comanche permit it to act as an *ISR and engagement integrator* of Army, joint, and multinational combat power for all forms of operational and tactical

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<sup>32</sup> TRADOC, *Objective Force White Paper*, 17



maneuver. Advanced C3 capabilities embedded within the Comanche will enable it to direct *joint* mobile strike, continuously integrating multiple ISR sources with an equally diverse array of highly responsive, long range Army and joint precision engagement systems.

Division and Corps Aviation UEs will conduct strike operations in support of engaged forces and as independent operations in support of higher-level objectives throughout their respective AOs. Division aviation forces will be focused on targets at tactical depth, with corps attack aviation in a reinforcing role as needed. UE attack aviation will also conduct shaping operations against enemy forces and capabilities, including *mobile strike* at both tactical (division) and operational (corps) distances. Objective Force aviation UEs will include organic capability to command and control other non-aviation units of action, including maneuver UAs, when appropriate to the situation. At present, it is envisioned that the division air-ground task force will almost always include at least one multifunctional aviation UE, while several different aviation UEs (variable compositions) will normally form part of the Objective Corps.<sup>34</sup>

In summary, the Objective Force will be designed to conduct long-distance (300km) vertical envelopments to multiple objectives simultaneously. This concept relies heavily on the close integration of fixed and rotary wing airpower with the scheme of maneuver of Objective Force Units of Action. Airpower will enable ground freedom of maneuver by rapidly transporting Objective Forces into theater and then assist in setting the conditions (shaping) for the success of FCS equipped battalions and brigades vertical envelopments and Red Zone engagements and battles. The expectation is that FCS units, supported by their Unit of Action and Unit of Employment headquarters organic assets, will *normally* have sufficient firepower and maneuver capabilities to defeat enemy forces in the Red Zone. However, if the need should arise, robust joint communications networks and airborne “joint integrators” (Comanche) are designed into the system to facilitate JCAS or other joint asset participation in Red Zone fights.

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<sup>33</sup> TRADOC, “UE Concept,” 26.

<sup>34</sup> TRADOC, “UE Concept,” 25.

### III. CLOSE AIR SUPPORT HISTORY

#### Korea

The Air Corps gained its independence from the Army in 1947. In March of 1948, the service chiefs met at Florida's Key West Naval Base in an attempt to clarify the primary and collateral functions of the services as outlined in the National Security Act of 1947.<sup>35</sup> The intent was to eliminate the duplication of service capabilities wherever possible. In the Key West Agreement, the Air Force pledged to provide the Army with airlift and close air support.<sup>36</sup> Close air support was defined by the agreement as "air action against hostile targets which are in close proximity to friendly forces and which require detailed integration of the air mission with the fire and movement of those forces."<sup>37</sup> This agreement did not prohibit the Army from conducting CAS with its organic rotary and fixed wing aircraft. It was not until 1951 that a memorandum of understanding between the Secretary of the Army, Frank Pace, and the Secretary of the Air Force, Thomas Finletter, stated that the functions of Army aircraft could not duplicate the functions of Air Force aircraft. This memorandum was the beginning of a series of revisions to the Key West Agreement that further refined the role, purpose, and capabilities of organic Army aviation.<sup>38</sup>

When the Korean War broke out in June 1950, the Army and Air Force were ill prepared to conduct joint close support missions. The Air Force was training, organizing, and equipping itself to fight with modern jets, bombers, and the atomic bomb against another industrialized nation. The Army had been cut to ten undermanned divisions with little money or incentive to conduct joint training exercises. The Army believed its organic artillery and weapon systems

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<sup>35</sup> Morton H. Halperin and David Halperin. "Rewriting the Key West Accord," in *Reorganizing America's Defense: Leadership in Peace and War*, ed. Robert J. Art, Vincent Davis and Samuel P. Huntington (Washington D.C.: Pergamon Brassey's International Defense, 1985), 346.

<sup>36</sup> Alice C. Cole, *The Department of Defense: Documents on Establishment and Organization, 1944-78* (Washington D.C.: Pergamon Brassey's International Defense, 1985), 346.

<sup>37</sup> Keithly, "Revamping Close Air Support," 15.

<sup>38</sup> Morton H. Halperin and David Halperin. "Rewriting the Key West Accord," 346.

were sufficient to defeat enemy forces within the “bomblines.”<sup>39</sup> The bomblines in Korea tended to coincide with the outer limits of the effectiveness of corps artillery (approximately 8 miles from the front line).<sup>40</sup> Doctrinally, airpower was to be used to attack targets outside of artillery range. Therefore, integrated ground and air attacks inside artillery ranges were expected to take place “only in well defined circumstances where the targets were clearly marked, friendly troop positions were easily identifiable, and ground and air controllers could maintain positive control of airstrikes.”<sup>41</sup> During the first year of the war when United Nations (UN) forces were often outnumbered and outgunned, this doctrine of ‘segregation’ of air and ground power resulted in increased fratricide, delays, and unnecessary confusion that cost American and Allied lives.<sup>42</sup>

Political restrictions against attacking North Korea’s allies and supply bases north of the Yalu River meant that the “center of gravity” for both the Army and the Air Force became the North Korean fielded forces. However, the Army and USAF disagreed on which decisive points should be attacked to facilitate the rapid defeat of the North Koreans.<sup>43</sup> With air superiority achieved relatively early in the war and having only a limited number of strategic targets, the USAF focused on the next priority outlined in FM 31-35, air interdiction.<sup>44</sup> The Army, which had been pushed back to the Pusan perimeter, was short on Artillery and was continually having to shift forces to defeat enemy attacks, saw the use of CAS against the enemy’s frontline troops as the most important mission of the USAF (after air superiority).

Since the first use of aircraft against ground targets, there has never been much of a doctrinal dispute over placing the CAS mission temporarily ahead of interdiction on an

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<sup>39</sup> The bomblines were referred to as the bomb safety line (BSL) during World War II. This line helped identify the forward lines of troops and allowed aircraft supporting the ground forces to attack targets beyond it without fear of hitting friendly troops. In WWII, it was usually placed about 1000 feet in front of the forward most friendly position and marked with colored smoke or panels.

<sup>40</sup> Franklin B. Cooling, Case Studies in the Development of Close Air Support (Office of Air Force History, US Air Force, 1990), 351.

<sup>41</sup> Ibid., 351.

<sup>42</sup> Ibid., 353.

<sup>43</sup> Lewis, *A Ground Commanders Conflicting View with Airmen*, 71.

<sup>44</sup> Department of the Army, *FM 31-35 Air Ground Operations*, 13 August 1946, 12. This manual was based primarily on the procedures developed by the US 12<sup>th</sup> Army Group and Ninth Air Force in northern Europe between 1944-45.

emergency basis.<sup>45</sup> Redistribution of interdiction sorties to CAS was conducted numerous times during the conflict. However, the Air Force and the theater commander, General Douglas MacArthur, placed interdiction above CAS on a day-to-day operational basis.<sup>46</sup> This priority is demonstrated by the fact that from the outbreak of hostilities in 1950 until the cease-fire in 1953, 337,913 interdiction sorties were flown compared to only 131,395 CAS sorties (which amounted to about 30% of the total ground attack sorties flown during the war).<sup>47</sup>

By doctrine, the Air Force was fully justified in assigning its own priority to CAS unless overridden by the Theater Commander. FM 31-35, *Air-Ground Operations*, stated that “the tactical air commander, in close cooperation with the Army group commander, determines the allocation of air effort to be made available to the separate tactical air forces for employment with their associated armies.”<sup>48</sup> It also established the lowest echelon of decentralization in determining air mission priorities as the tactical air force. To facilitate coordination on air-ground missions, a Joint Operations Center (JOC) was established. The JOC was responsible for processing tactical air requests and directing tactical air missions through the Combat Operations Section and the Tactical Air Control Center (TACC). The TACC was the Air Force’s command and control agency for actual CAS assets. Tactical air requests within this system went through the Air-Ground Operations System (AGOS), which was staffed by Army officers and connected the Army headquarters to each corps and then division headquarters. With the outbreak of the Korean conflict, TACC and Army Field Forces published the “Joint Training Directive for Air-Ground Operations (JTD).<sup>49</sup> This directive extended the AGOS down to regimental and armored combat command level.

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<sup>45</sup> Lewis, *A Ground Commanders Conflicting View with Airmen*, 33.

<sup>46</sup> James A. Winnefeld and Dana J. Johnson, Joint Air Operations, Pursuit of Unity of Command and Control, 1942-1991 (Annapolis: Naval Institute Press, 1993), 56.

<sup>47</sup> Cooling, Case Studies in the Development of CAS, 396.

<sup>48</sup> Department of the Army, *FM 31-35*, 12.

<sup>49</sup> Cooling, Case Studies in the Development of CAS, 350.

Prior to the war, USAF doctrine had established that the control of air attacks was the responsibility of Air Force personnel. The USAF had two types of close control agencies: the ground forward air controller (FAC) of the Tactical Air Control Party (TACP) and an airborne Tactical Air Coordinator (TAC).<sup>50</sup> Only pilots (officers) with prior experience in flying CAS missions were authorized to direct close support sorties.<sup>51</sup>

Due to inadequate doctrine and mistaken assumptions on the nature and operational environment of the next war, these early TACPs were not sufficiently manned, trained nor equipped to control CAS missions in Korea. They also lacked adequate integration with the ground forces. For example, in July 1950, when Tactical Air Control Parties (TACP) assigned to the 24<sup>th</sup> Division attempted to direct air strikes near the front lines, they often operated independently (without coordination with nearby ground forces) and from exposed positions on hilltops. This led to several Forward Air Controller (FAC) deaths.<sup>52</sup> As a result of unreliable TACP radio equipment, the destruction of almost all of the AN/ARC-1 TACP radio jeeps, and the inability to keep up on the fluid battlefield, the temporary withdrawal and reorganization of FACs from the front during this critical month of the war was ordered.<sup>53</sup>

Under the initial CAS control system in Korea, “the division remained the lowest tactical formation that could assume permanent assignment of a TACP.”<sup>54</sup> With the JTD guidance published at the outbreak of hostilities, each regiment was provided a TACP. Given its experience in WWII, the Army did not initially debate the policy of only assigning one TACPs to each regiment/brigade. During WWII, the Army had primarily utilized CAS as a Corps level ‘shaping’

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<sup>50</sup> The TACP is the principal Air Force liaison element aligned with Army maneuver units from battalion through corps (only down to Brigade level during most of Korean War). The primary mission of corps- through brigade-level TACPs is to advise their respective ground commanders on the capabilities and limitations of aerospace power; Brigade / Battalion TACPs have the additional task of providing terminal control to CAS missions. The TACP provides the primary terminal attack control of CAS in support of ground forces.

<sup>51</sup> Cooling, *Case Studies in the Development of CAS*, 348. FACs are the most forward element of the Theater Air Control System and are responsible for final mission control. A FAC is usually an airman experienced in air-to-ground operations who, from a forward ground or airborne position, controls aircraft in close air support of ground forces (during Korean War, FACs were Air Force and Marine pilots; today, specially trained enlisted airmen normally conduct terminal control of aircraft).

<sup>52</sup> Ibid.

<sup>53</sup> Robert F. Futrell, *The United States Air Force in Korea 1950-1953* (Washington D.C.: Office of Air Force History, 1983), 80.

asset which was integrated into the ground tactical plan through the corps fire support coordination center (FSCC).<sup>55</sup> As a result, 24<sup>th</sup> ID initially received only three TACPs to direct air strikes. By the end of July 1950, this number had been increased to ten (shared between 24<sup>th</sup> ID and I ROK Corps) due to the critical need for close support.<sup>56</sup> These CAS command and control deficiencies culminated in September 1950 with the worst documented case of air to ground fratricide during the War when an Air Force F-51 mistakenly engaged and killed/wounded over 76 Scottish ground forces.<sup>57</sup>

The first use in Korea of an airborne controller to spot targets for and direct the attack of jet aircraft occurred on 9 July 1950.<sup>58</sup> Two FACs with two Army L-5G liaison planes with modified four channel VHF radios were brought to Taejon to help direct CAS missions. These aircraft were mostly unarmed except for aerial rocket dispensers that were used to mark target locations with phosphorus rockets. Additional techniques for marking were basically the same as during WWII: colored panels, artillery smoke, and radio “talk-on’s.” The Air Force air FACs, which did not officially exist as an Army or Air Force doctrinally recognized organization, were designated as “Mosquitos.”<sup>59</sup> After a month of demonstrating their usefulness and effectiveness, the Mosquitos became an official USAF organization.

Doctrinally, for the integration and control of airpower, the ground commander would keep his ALO nearby to request air support and the FACs with the TACPs at the front to direct strikes. However, a lack of proper radio equipment and problems communicating with higher headquarters often resulted in the ground commander keeping his ground FAC nearby to establish contact the Mosquitos, who would then in turn make contact with the Tactical Air Control Center and relay the request.<sup>60</sup> The ground FAC was then often “out of position” to observe the strike

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<sup>54</sup> Ibid., 350.

<sup>55</sup> Ibid.

<sup>56</sup> Ibid., 364.

<sup>57</sup> Cooling, *Case Studies in the Development of CAS*, 369.

<sup>58</sup> Gary R. Lester, *Mosquitoes to Wolves: The Evolution of the Airborne Forward Air Controller* (Maxwell AFB, AL: Air University Press, 1997), 34.

<sup>59</sup> Ibid., 35.

<sup>60</sup> Raymond O. Knox, *The Terminal Strike Controller: The Weak Link in Close Air Support* (Fort Leavenworth, KS: School of Advanced Military Studies, 1989), 11.

and could only describe the target to the air FAC who would then direct the attack. These issues and procedure resulted in air FACs controlling over 90% of CAS missions during the first 18 months of the war.

Just as with the Army and Air Force, the Navy and Marines fought in Korea with the doctrine, organization, and equipment that they had developed during World War II. The Navy/Marines agreed with the USAF that gaining and maintaining air superiority was the most critical mission of airpower.<sup>61</sup> In the conduct of ground operations though, “naval aviators viewed interdiction and close air support as equally important, with the enemy situation and the landing force commander’s plan the determining factors.”<sup>62</sup> The close support system that they developed stressed rapid response and decentralized management of sorties. To facilitate this, the Marines had battalion level TACPs composed of two Marine aviators and eight enlisted communications specialist who maintained a communications net that could communicate directly to the Tactical Air Control Center.<sup>63</sup> After receiving the request, the TACC evaluated its available aircraft and competing missions to determine the sorties available to respond. The request was then filled as rapidly as possible, for the TACC assumed that the battalion TACPs had already determined that artillery or naval gunfire was unavailable or inappropriate for the requested target.<sup>64</sup> The Navy/Marines also utilized a “push-CAS system” whenever possible to ensure a rapid response to the requests. In a push-CAS system, tactical air assets are preassigned to frontline units and maintained on “air alert” until needed or relieved.<sup>65</sup>

The Air Force preferred to utilize a “pull-CAS” system to support ground operations. This system required ground forces to request CAS when needed from a central pool of air assets. The USAF also preferred “strip alert” to air alerts because it was much more economical, allowed

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<sup>61</sup> Cooling, 351; Specifically to protect the fleet and landing force from enemy air operations.

<sup>62</sup> Ibid.

<sup>63</sup> Ibid.

<sup>64</sup> Ibid., 351.

<sup>65</sup> Lewis, *A Ground Commander’s Conflicting View with Airmen*, 36.

pre-strike briefings to the pilots prior to takeoff, and provided the potential for the concentration of CAS assets on demand at decisive times and locations along the front.<sup>66</sup>

With the elimination of the requirement for an intervening ground headquarters to process and approve requests and the use of push-CAS, the Marines usually received CAS within ten to fifteen minutes from the initial request. The system used by the Army and USAF took on average forty to fifty minutes.<sup>67</sup> General William M. Momyer, who commanded the Air Force Tactical Air Command from 1968 to 1973, gives a good synopsis of the reasoning behind Marine CAS doctrine in his book, *Air Power in Three Wars*:<sup>68</sup>

Since amphibious forces are without the artillery support normally organic to an Army division constituted for sustained land warfare, Marine landings forces are dependent upon naval gunfire, carrier based air, Marine air, and Air Force air (if within range) for fire support. After the forces hit the beach, Marine air augments the limited organic artillery. Then, since the Army is responsible for the conduct of prompt and sustained combat operations on land, Army forces replace Marines after the objective area is secure and the Marines either withdraw or become a part of the Army forces. Marine airpower is thus basically tailored to the needs of the landing force, including some fighters for local air defense. For interdicting the landing area and gaining control of the air, the Marines are dependent upon carrier-based air and land-based air. Thus, these higher priority missions are outside the basic responsibility of Marine aviation, which is close air support.

With UN forces having complete air supremacy over Korea and Naval operations unhampered by enemy air or naval forces, the Marine system worked well in providing responsive and timely CAS. As a result, the Marine system came to be the envy of many Army officers.<sup>69</sup>

In November 1950, the Army unsuccessfully proposed a revision of CAS doctrine whereby “field Army commanders and their corps subordinates would be provided operational control of fighter-bombers on a scale of one air group per division.”<sup>70</sup> General MacArthur’s replacement as UN commander, General Mark Clark, and the commander of X Corps, Lieutenant

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<sup>66</sup> Cooling, 352; One reason why the Navy/Marines could do this was that they had far fewer competing missions for the number of air assets. Doctrine did not prohibit USAF from using Push-CAS method. They choose Pull-CAS because of their priorities of air superiority and interdiction and not want have assets “standing-by” while they could be used in an interdiction. Also argued that they could pre-brief pilots and configure aircraft with correct bombs.

<sup>67</sup> Ibid., 372.

<sup>68</sup> William M. Momyer, *Air Power in Three Wars* (Washington, DC: US Government Printing Office, 1978), 59.

<sup>69</sup> Marine CAS system worked well for the three Marine divisions. If you were to expand this same system to 40 or 50 Army divisions in a major war, the cost in personnel, training, and equipment would have been extensive.

<sup>70</sup> Cooling, *Case Studies in the Development of CAS*, 371.



General Ned Almond, spearheaded this effort. Clark wanted TACPs down to battalion level, a JOC for every Army corps, and operational control of tactical air assets to Army corps so that the “the air commander would have to request their use for interdiction missions, by exception, from the ground commander through the theater commander.”<sup>71</sup> In addition to supporting the views of General Clark, General Almond wanted a push-CAS system similar to the one he had enjoyed as a division commander in Italy during WWII. General Almond summarized his concerns in the following statement:<sup>72</sup>

The chief objection I had to the support that we received in Northeast Korea was the fact that the Air Force’s high command desired notification of tactical air support requirements 24 hours in advance. I explained to General Partridge, the 5<sup>th</sup> Air Force Commander who visited me frequently, that this was impossible. Our requirements for immediate air support were not always predictable 24 hours in advance; we needed an Air Force commitment to respond to unplanned tactical air support requests within 30–50 minutes of the initial request so that the enemy located by ground units could not be moved to a different place and probably better concealed. This was my chief complaint and my constant complaint. The Air Force required requests for the support too far ahead of the use to which it was to be put. . . . What they had really been doing was conducting a planned bombardment program in support of tactical ground units when what we wanted was instant support for contacts made by troops on the ground in various areas along the front line.

Almond’s impatience with the USAF system led him to develop and implement innovative methods for improving the responsiveness of CAS. One highly controversial program was the creation of additional TACPs within X Corps that were manned and equipped by Army officers and enlisted men. Almond wanted a minimum of one TACP with each combat battalion. The USAF doubted the effectiveness of ground TACPs and thought the number requested was excessive. The USAF also insisted that a TACP should include a qualified tactical pilot and that they (USAF) did not have enough pilots to create the desired number of TACPs. Despite the disagreement, by February 1951, X Corps had seventeen Air Force TACPs and eighteen Army ones.<sup>73</sup> With each X Corps battalion having a TACP (like in the Marine system), CAS

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<sup>71</sup> Lewis, *A Ground Commander’s Conflicting View with Airmen*, 58.

<sup>72</sup> Ibid., 58. Lewis took quote from Almond Papers, Senior Officers Debriefing Program, Tape 5, 57.

<sup>73</sup> Cooling, *Case Studies in the Development of CAS*, 375.

coordination was improved, but due to focus on interdiction, the number of CAS missions distributed to X Corps remained basically unchanged.

Two joint boards were established in 1951 to investigate the Army's complaints about the quality and quantity of CAS in Korea. The boards reached similar conclusions in that each believed the doctrine and C2 arrangements established in FM 31-35 and the JTD were not significantly flawed. Instead, the primary problem with CAS was that "the Air Force and the Army had not yet provided the trained staffs, control agencies, and communications systems necessary to make the doctrine work."<sup>74</sup> Although acknowledging the training, staffing, and communications deficiencies, the Army still believed the doctrine needed to be changed. In November 1952, General Clark requested that General Almond, who was by then the Army War College Commandant, conduct a survey of War College students who had been former combat commanders in Korea on the effectiveness of CAS. A summary of the key results were as follows:<sup>75</sup>

1. The JTD gave too much control to the USAF over tactical air assets. "The attack or non-attack of specific targets in connection with the conduct of the land battle is a matter of primary and overriding concern to the ground commander, since striking or not striking targets within the land battle area materially affects the outcome of the land battle, but affects the air battle not at all."
2. Major deficiencies in the use and employment of CAS existed in the area unity of command, flexibility in tactical air support, flexibility in planning, and flexibility of control.
3. The Army should have operational control of CAS assets and that this control should be decentralized as low as the corps level.
4. *Question:* Were any of your requests for air support refused by the Air Force? If so, what reasons were advanced for the refusal?  
*Answer:* Yes, frequently. Unavailability due to priority targets elsewhere and weather at the air base. The 5<sup>th</sup> Air Force opposed the Corps Commanders view on "the need for" air support."

With little support in Washington for his ideas or the relevancy of the results of the War College survey, General Clark let the initiative for corps commanders to gain operational control

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<sup>74</sup> Ibid., 372.

<sup>75</sup> Lewis, *A Ground Commander's Conflicting View with Airmen*, 56-58.

of tactical air assets die. He was able to reach a “gentlemen’s” agreement with General Weyland, the FEUSAF commander, to provide more Air Force TACPs to his Infantry battalions.<sup>76</sup>

Although not officially stated, General Almond’s and Clark’s views and conclusions about CAS during the Korean War were to have a significant impact on Army doctrine, organization, and equipment. Both General Clark and Almond believed that “the Army requires at least one fighter-bomber group or equivalent per army corps of three divisions, and the aviation necessary for essential tactical air reconnaissance... If operational control is not attainable, then the Army must have its own tactical aviation.”<sup>77</sup> The next 10 years was spent by the Army developing the doctrine, units, and equipment for “its own tactical aviation.” The helicopter, which was in its infancy during the Korean War, would serve the Army extensively in its next conflict as both a transportation and close support asset.

## Vietnam

During the 1950s, close air support once again took a back seat to other priorities. President Eisenhower had declared at the end of the Korean War that the U.S. would “never again get bogged down in a conflict where the full brunt of American power could not, or would not be applied.”<sup>78</sup> He instituted a “new look” defense policy that focused on nuclear warfare, strategic airpower, and preparing smaller friendly nations to fight their own local wars.<sup>79</sup> Secretary of the Air Force Thomas K. Finletter declared, “The Korean War was a unique, never-to-be-repeated diversion from the true course of strategic airpower.”<sup>80</sup> Therefore, just as it was in the period before the Korean War, the Air Force focus during the 1950s was on training, organizing, and equipping to fight and win a war against the Soviet Union.<sup>81</sup> Given this guidance, the USAF

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<sup>76</sup> Ibid., 42.

<sup>77</sup> Ibid., 59.

<sup>78</sup> Cooling, *Case Studies in the Development of CAS*, 411.

<sup>79</sup> Earl H. Tilford, *Setup: What the Air Force did in Vietnam and Why* (Maxwell AFB, AL: Air University Press, 1991), 25.

<sup>80</sup> Tilford, *Setup*, 238.

<sup>81</sup> Momyer, *Airpower in Three Wars*, 249.

disbanded the 6147<sup>th</sup> Tactical Control Group (the Mosquitoes), and focused on the design and production of multi-role jet aircraft that could conduct ground attacks as well as nuclear delivery, air superiority, and reconnaissance missions. In the words of Air Force Chief of Staff General John P. McConnell, “the Air Force did not start doing anything about tactical aviation until about 1961 or 1962.”<sup>82</sup> Even then, it was not until 1965 that the first Air Force jet aircraft conducted strikes in Vietnam.

The Army’s focus during the 1950’s was on fighting a large scale conventional war in Europe against the Soviets. The Army had taken note of the Air Force’s declining interest in CAS and in 1955 announced that it was no longer bound by the principles of the 1950 Joint Training Directive.<sup>83</sup> To compensate for a perceived lack of support from the Air Force, the Army began an extensive expansion and modernization of its aviation platforms.<sup>84</sup> In 1958, the Army sought to purchase its own CAS aircraft, an Italian turboprop, but was stopped due to joint and legislative agreements on the roles and capabilities of Army organic aviation.

In 1959, Joint Chiefs of Staff (JCS) Pub 2, *Unified Action of the Armed Forces*, assigned the USAF as the sole service responsible for determining CAS doctrine, organizations, and equipment.<sup>85</sup> In response, the Army conducted or participated in three major studies on CAS over the next four years. In 1961, the Army and Command and General Staff College conducted a CAS study which recommended that:<sup>86</sup>

1. Army-Air Force joint operational planning be decentralized to the level of field army and tactical air force.
2. Allocated resources for CAS should be adequate for the actual need.
3. CAS should be under the operational control of the ground commander with a minimum of three USAF squadrons designated solely for CAS assigned to each Army division.

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<sup>82</sup> Cooling, *Case Studies in the Development of CAS*, 411.

<sup>83</sup> *Ibid.*, 399.

<sup>84</sup> Aviation went from 3,495 to 5,475 fixed and rotary wing aircraft between 1955 and 1960 and over 5000 helicopters alone by 1965; Cooling, 413.

<sup>85</sup> Lt Col Harold T. Gonzales, *Tactical Air Support of Ground Forces in the Future*, Research Report No. AU-ARI-89-7, (Airpower Research Institute, 1990), 51.

<sup>86</sup> Cooling, *Case Studies in the Development of CAS*, 414.

The Army Chief of Staff at the time, General George Decker, summed up the Army's view by writing: "The Army's requirement is to have close air support *where* we need it, *when* we need it, and under a system of operational control that makes it *responsive* to Army needs."<sup>87</sup>

In 1962, at the direction of Secretary of Defense McNamara, the Army convened the Mobility Requirements Board, which was chartered to take a "bold new look" at land warfare mobility and aviation support.<sup>88</sup> The "Howze Board," as it later came to be known, recommended that the Army develop air assault divisions with organic armed helicopters and rotary and fixed wing assault transports. The board also reiterated the recommendations of the CGSC study by advocating that these new armed Army aviation assets remain under ground commander control, that the USAF develop an aircraft designed for close support, and that the USAF adopt quantitative requirements for CAS.<sup>89</sup> The USAF countered one month later with the Tactical Air Support Requirements Board, or "Disosway Board," which reaffirmed existing doctrine and advocated that all combat aviation functions conducted by air vehicles should be under the control of the Air Force. The Disosway Board further stated their belief that armed rotary wing aircraft would not be survivable in a high threat environment and that single purpose aircraft were not affordable given limited funding and usefulness.<sup>90</sup>

In 1963, Secretary of Defense McNamara instituted the Army-Air Force Close air Support Board to sort out the issues. As a result of this board, improvements were made in close support tactics, techniques, procedures and training. Unfortunately, no consensus was reached by the services on the command and control issues or the type of aircraft needed for effective CAS. The Army side-stepped the roles and missions issues of armed helicopters being used to conduct CAS by creating a new doctrinal concept called "Direct Aerial Fire Support (DAFS)." DAFS was defined as "fire delivered by aerial vehicles *organic* to ground forces against surface targets

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<sup>87</sup> Ibid.

<sup>88</sup> Moymer, Airpower in Three Wars, 254.

<sup>89</sup> Cooling, Case Studies in the Development of CAS, 414. Ground commanders wanted a specific number of CAS sorties per day allocated to each Army division. By this time, Europe war plans were already allocating 35-40 sorties per day for each division (5 sorties per Battalion for planning factor).

<sup>90</sup> Ibid., 416.

and in support of land operations.”<sup>91</sup> An Army statement during the FY 1966 DOD

Appropriations proceedings attempted to clarify the difference:<sup>92</sup>

Close air support (fixed wing missions) calls for penetration of a hostile environment, delivery of heavy munitions on relatively stationary targets, and protection of friendly forces against hostile air attack...Direct aerial fire support is provided by the attack helicopter, which is one of a family of ground firepower systems. All its characteristics (weapons, target acquisition, nature of its targets, integration of fires, command and control) it shares in common with other Army weapon systems. Helicopter fires are typical of all fires that take place at the line of contact, the flanks, and within the battle position where a premium is placed on quick response, all weather capability, and a high order of accuracy in delivery of fires. There is a small area of overlap between close air support and direct aerial fire support on the battlefield. This overlap is considered necessary and desirable.

Between 1963 and 1965, the Army began to experiment with armed propeller driven Mohawk fixed wing aircraft for “fire support” and augmented its local air movement capabilities with the Caribou transport aircraft. This endeavor was a direct result of the belief by Army leadership that the 1957 Department of Defense Directive 5160.22, which stated that U.S. Army aviation would *not* provide an aircraft to perform the function of close combat air support or logistical support, was no longer valid. Secretary of Defense Robert McNamara’s endorsement of the Howze Board recommendations for the creation of air assault divisions and armed helicopters was the impetus for this belief. In 1965, concerned that the Army was moving beyond procurement of aircraft directly related to its mission, Secretary of Defense McNamara put an end to the armed Mohawks and additional fixed wing transport debate by declaring:<sup>93</sup>

I have overruled the Army in their request for purchase of what is known as the BUFFALO, a successor to the CARIBOU to carry on a transport function that I believe the Air Force can properly carry with its C-130s and C-123s. Similarly, I have refused the Army permission to buy the MOHAWKS and other aircraft (fixed wing) which might be used for close air support functions.

By 1963, the North Vietnamese had begun to conduct battalion sized attacks against South Vietnamese units. The war was no longer a small scale “guerilla” insurgency against the

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<sup>91</sup> Peter A. Costello, *A Matter of Trust: Close Air Support Apportionment and Allocation for Operational Level Effects*, (Maxwell AFB, AL: Air University Press, 1997), 35.

<sup>92</sup> Robert F. Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force 1961-1984*, vol. 2 (Maxwell AFB, AL: Air University Press, 1989), 518.

<sup>93</sup> *Ibid.*, 517.

government. In response, the U.S. increased its number of advisors and tactical air support. To conduct operations, the Vietnamese had divided South Vietnam into four corps areas, with each corps commander having almost absolute authority within his area. Vietnamese air units were assigned to a corps zone and came under the direct control of the corps commander.<sup>94</sup> For American aircraft, the corps Air Support Operations Centers (ASOCs) would control CAS on the basis of daily sorties made available from the Seventh USAF Air Operations Center (AOC) to specific geographical regions of the country. Each ASOC would then usually distribute its daily quota to subunits within the corps. Instead of a single air manager who maintained centralized control of air assets, the South Vietnamese, USAF, Army, and Navy/Marines each controlled their own aircraft. Even within the USAF, Strategic Air Command (B-52 Bombers) and some of Military Airlift Command aircraft remained outside of the jurisdiction of Seventh Air Force (Air component commander for Vietnam). To make matters even more complicated, these organizations used two different systems for control of air assets. Army and Marines aircraft were controlled by the U.S. Army's Air-Ground System and South Vietnamese and Air Force assets used the Air Force Tactical Air Control System. As a result, there was often uncontrolled congestion over target areas that increased the potential for midair collisions, fixed and rotary wing tactical airlift aircraft that flew through air strikes, and B-52s that would drop their bombs without advance notice to other tactical air units.<sup>95</sup>

Due to Rules of Engagement issues and concern about civilian casualties on the non-linear battlefield, request for air support had to run up and down parallel military and civilian channels. This often led to excessive delays and cancellation of requests. The Air Force TACPs, which were only assigned down to regimental level, were often unable to conduct terminal control of CAS assets due to the thick jungle canopy and widely dispersed combat operations (they could not see and could not get to where they were needed). With the deactivation of the

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<sup>94</sup> Momyer, *Airpower in Three Wars*, 250.

<sup>95</sup> Cooling, *Case Studies in the Development of CAS*, 457.

Mosquito air FACs in 1956, the USAF had to utilize Army artillery spotter aircraft to assist in the control of CAS sorties until Air Force FAC(A) units and aircraft were reintroduced in 1963.<sup>96</sup>

Other deficiencies of note in the early Vietnam CAS system included lack of procedures to coordinate artillery and air firepower, cumbersome CAS control procedures, the saturation of the airspace below 9000 feet (by helicopters, spotter aircraft, attack aircraft, artillery rounds), inadequate communications between terminal controllers and corps ASOCs, and the lack of qualified personnel for terminal control of CAS.<sup>97</sup> These deficiencies directly contributed to the Vietnamese 33<sup>rd</sup> Ranger and 4<sup>th</sup> Marine Battalions being wiped out due to the inability to get required close air support.<sup>98</sup> Air Force Chief of Staff, General Curtis Lemay, confirmed the findings of an USAF investigative team that the doctrine “contained poor procedures for requesting strikes and required high level approval for on call fighter attacks; these factors combined with inadequate communications built in excessive delays for the efficient use of the tactical air effort.”<sup>99</sup>

With the announcement in 1965 that large numbers of ground troops were to deploy to Vietnam, the need for improved USAF capabilities in conducting coordinated ground attacks in a non-linear and limited war became urgent. The Commander in Chief Pacific (CINCPAC) reinforced this conclusion by decreeing that “the primary mission of airpower in South Vietnam was close air support.”<sup>100</sup> This new sense of urgency led to the Army and Air Force service chiefs signing a “Concept of Improved Joint Air Ground Coordination.” Combined with additional improvements made to the air request and control system between 1961 and 1964, the Army now had a CAS system in Vietnam that was similar to the one developed and utilized by the Marines during WWII and Korea. Specifically, each maneuver battalion now had an Air Force Tactical Air Control Party, each corps level unit had Direct Air Support Centers (DASCs), and immediate

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<sup>96</sup> Lester, *Mosquitoes to Wolves*, 110.

<sup>97</sup> Cooling, *Case Studies in the Development of CAS*, 423.

<sup>98</sup> Ibid. The most frequent finding of investigations of this case and similar incidences found primary reason of excessive delays was that requests for air support never reached Corps Level Air Support Centers.

<sup>99</sup> Ibid., 420.

<sup>100</sup> Ibid., 448.



CAS request now went directly from the TACP to the corps DASC.<sup>101</sup> The memorandum of agreement also formalized the procedures for the apportionment and allocation of USAF sorties in support of ground operations. The theater/joint commander would now doctrinally apportion air assets by priority of effort, percentage, or geographic area. The Joint Operations Center (JOC), which became the Air Operations Center in 1962 and then the Tactical Air Control Center (TACC) in 1965, would translate the theater commander's guidance into action by allocating sorties daily to each ground component.<sup>102</sup> Individual component commanders were authorized to make apportionment recommendations directly to the joint commander prior to his decision. General Westmorland, the theater commander, directed that seventy percent of CAS sorties were to be distributed to ground commanders on a weekly basis and the other thirty percent held for immediate requests as the situation dictates.<sup>103</sup> Under this principal of "habitual availability," the ground commanders could better incorporate CAS into their planning. Due to the difficulty of determining the enemy situation a week out, ground commanders began to request the maximum amount of sorties per day in order to create an artificial "airborne alert" pools of aircraft. This meant that the aircraft were in a holding pattern over the battlefield and could rapidly respond when needed.<sup>104</sup> As a consequence of this practice, there was sometimes more requests for CAS than aircraft available; thereby potentially denying fixed wing CAS to a ground unit who really needed it.

Prior to the 1965 changes, response times for immediate air request averaged over ninety minutes and only about half of all requests were met.<sup>105</sup> After 1965, immediate requests were

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<sup>101</sup> Ibid., 433. The DASC (today called Air Support Operations Centers) could divert aircraft on airborne alert and forward air controllers, but only the TACC in Saigon could scramble aircraft on ground alert or divert air resources from another Corps.

<sup>102</sup> Ibid., 428.

<sup>103</sup> Ibid., 463. Cooling obtained these statistic from the Joint Chiefs of Staff, *Joint Study Task Force, Phase II*, "Close Air Support Study," 11 October 1972. On a typical day, 7<sup>th</sup> Air Force flew about 300 preplanned sorties, the Marines in I Corps another 200, and the VNAF about 100. Approximately 200 additional sorties would be flown each day without prior planning. Although the number of aircraft on ground alert varied according to the level of ground contact expected, on average about 40 aircraft were held on alert and were scrambled three to four times a day.

<sup>104</sup> Ibid., 450.

<sup>105</sup> Ibid., 423. In Vietnam, immediate request were considered to be any close air support that was needed three hours or less after the request. In reality, this the request was usually required to be filled as soon as possible. CAS needed three hours or later was defined as preplanned.

answered within twenty minutes by airborne aircraft and forty minutes by ground alert aircraft. In 1972, a joint Army-Air Force study further determined that fifty percent of immediate CAS requests should be answered within fifteen minutes, seventy-five percent in twenty minutes, and one hundred percent within forty minutes.<sup>106</sup> This goal supported analysis which indicated that half of all troops in contact situations in Vietnam lasted less than twenty minutes.<sup>107</sup>

The vast majority (70%) of CAS sorties during Vietnam were preplanned missions in support of search and destroy operations against troops, artillery, and supply vehicles. CAS was used against only one North Vietnamese tank prior to 1971. During the 1972 Easter offensive, when the North Vietnamese used a large quantity of armor, approximately 227 tanks were destroyed by CAS (25 of these by Army helicopters).<sup>108</sup> The use of Army helicopters in the close support role resulted in only 10%-15% of the ground battles requiring immediate/emergency fixed wing CAS.<sup>109</sup> This percentage though, would vary according to the situation. For example, during a period of extensive search and destroy operations between March and June 1966, over 90% of these missions received fixed wing tactical air support, with 30 % of these in support of troops in contact. These statistics and employment methods seem to demonstrate that on a non-contiguous battlefield such as Vietnam, the primary distinction between CAS and Air Interdiction missions was the requirement for some type of ground or airborne terminal control, and not the presence of troops.

In late 1967, the movement of large enemy forces to the Khe Sanh area and massing of troops in preparation for the new years Tet Offensive, prompted General Westmorland to direct General Momyer, the COMUSMACV Deputy for Air Operations, to brief Marines on plans for Momyer to assume operational control over the 1<sup>st</sup> Marine Air Wing (excluding its helicopters

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<sup>106</sup> Ibid., 449.

<sup>107</sup> Donald J. Mrozek, *Air Power and the Ground War in Vietnam: Ideas and Actions* (Maxwell AFB, Ala.: Air University Press, 1988), 118.

<sup>108</sup> "An Historical Analysis of the Effectiveness of Tactical Air Operations Against, and in support of Armored Forces," *Draft Report Prepared for Sandia Laboratories under Contract Number 07-5874* (Dunn Loring, VA: Historical Evaluation and Research Organization, 1980), 33.

<sup>109</sup> Gonzales, *Tactical Air Support of Ground Forces in the Future*, 57. Average percentage over entire course of war.

and fixed wing transports).<sup>110</sup> After strong objection, the Marines agreed only as long as requests for CAS did not have to be routed through the TACC of Seventh Air Force and all III MEF complaints on the new system would go directly to COMUSMACV and CINCPAC. Even with the addition of Marine strike and reconnaissance aircraft under a single air manager, Army helicopters, Army fixed-wing reconnaissance aircraft, Marine helicopters, and Marine airlift were still managed by their parent service. The Navy only agreed to provide a certain number of daily sorties for the single air manager's use.<sup>111</sup>

Since the Air Force considered CAS a joint asset under the operational control of the joint force commander, to them the single air manager system "incorporated the fundamental principles of sound organization: unity of command, span of control, functional grouping, delegation of authority, and rapid decision making. Valuable air assets would not be weakened by being "penny-packeted" out to low-level units."<sup>112</sup> The Air Force believed this command and control arrangement would contribute to the overall operational success rather than simply limited tactical successes. Many Army and the Marine commanders continually protested this system throughout the war arguing that ground commanders should not only retain operational control of their organic air assets, but the Air Force sorties directly supporting the ground battle as well. The Army and Marine ground commanders believed that "the attack or non-attack of specific targets in connection with the conduct of the land battle is a matter of primary and overriding concern to the ground commander, since striking or not striking targets within the land battle area materially affects the outcome of the land battle, but affects the air battle not at all. Therefore, it is the ground commander, not the air commander who should determine if a target should be attacked."<sup>113</sup> OPCON of air assets to the ground commander for planning and mission execution was their preferred method to insure this level of support. At a minimum, the ground commanders

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<sup>110</sup> Cooling, Case Studies in the Development of CAS, 457.

<sup>111</sup> Ibid.

<sup>112</sup> Ibid., 458.

<sup>113</sup> Lewis, *A Ground Commander's Conflicting view with Airmen*, 59. Findings of AWC study in 1951 and CGSC study of 1961 as well.

wanted a dedicated number of sorties on a reliable basis during specific times so that they could effectively integrate CAS into mission planning and execution.

The war in Vietnam, fought on a non-linear battlefield with units operating in non-contiguous areas, was distinctly different from the linear battles of WWII and Korea. There was no “bomblines” to help pilots distinguish enemy formations from friendly. All towns, villages, and roadways within Vietnam were in the combat zone (with some exceptions). Because tactical air operations were considered integral to the ground scheme of maneuver, all air-ground attacks within South Vietnam were considered as CAS. The doctrinal Air Force priorities of air superiority, interdiction, and CAS were changed to reflect the realities of the political, military, and geographic situation. Once air superiority had been achieved, close support of ground troops became the primary mission of airpower.

The characteristic engagement in Vietnam was one in which the ground forces found and fixed the enemy, and then waited for airpower (both fixed and rotary) to destroy him.<sup>114</sup> The tactics, techniques, procedures, organizations and command and control arrangements that were eventually developed for CAS during the Vietnam War proved to be effective and popular. The CAS provided by the U.S. Air Force, Marines, and Army Helicopters directly contributed to the many battlefield successes of U.S. and South Vietnamese forces. General Wheeler, the Chairman Joint Chiefs of Staff from 1964 to 1968, said that “the CAS the Army received in Vietnam was better in quality, quantity, and responsiveness than ever before.”<sup>115</sup> In a post war survey, 60% of Army General Officers questioned rated Air Force cooperation in Vietnam as “outstanding” while only 2% called it unsatisfactory.”<sup>116</sup> Although doctrinal disagreements between command and control, responsiveness, and types of CAS aircraft persisted, the services eventually reached agreements and developed procedures that increased the effectiveness of CAS in Vietnam. Unfortunately, the cost of inadequate CAS doctrine, equipment, and training at the beginning of

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<sup>114</sup> Momyer, Air Power in Three Wars, 338.

<sup>115</sup> Cooling, Case Studies in the Development of CAS, 470. He was also the Army Chief from 1962 to 1964.

<sup>116</sup> Brigadier General Douglas Kinnard, The War Managers (Hanover, N.H.: University Press of New England, 1977), 48 & 63.

the conflict was measured in American and Vietnamese lives. The next opportunity for the joint force to employ CAS in a major land battle would not occur again until Operation Desert Storm. This would give the services eighteen years to reflect on the lessons learned from Vietnam and incorporate them into CAS doctrine, training, and equipment for the next war.

## Post Vietnam Initiatives

After the Vietnam conflict, the Army's first significant doctrinal change in the way they expected to fight the next war occurred in July 1976 with the introduction of the concept of the "Active Defense."<sup>117</sup> The active defense doctrine emphasized the concept of "fight outnumbered and win" on a European battlefield through the use of restrictive terrain combined with the application of ground forces frontline firepower and Air Force interdiction of Soviet second echelon forces. This doctrine was criticized as being too attrition oriented and focused on "firepower" and "force ratios."<sup>118</sup> In response, the Army introduced a revised doctrine in 1982 called "Airland Battle." This doctrine viewed the battlefield as three inextricably lined areas: rear, close, and deep. It placed a much greater emphasis on offensive action against the Soviet second echelon forces, the use of maneuver, and the counterattack. Corps commanders were required to influence the battlefield out to some 150 kilometers beyond the forward edge of the battle area by destroying, disrupting, or delaying enemy follow-on formations before they reached the main (close) battle area.<sup>119</sup> This would allow each successive echelon to be defeated in detail before they could be massed in time and space against NATO forces. As then Lieutenant Colonel Huba Wass de Czega stated: "The idea is to throw his timetable off so that we have a maneuver advantage, not to just 'whittle' down his forces."<sup>120</sup> The basic idea was to attack the enemy

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<sup>117</sup> Major Paul H. Herbert, *Deciding What Has to Be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations*, Leavenworth Papers Number 16 (Fort Leavenworth, KS: Combat Studies Institute, 1988), 1.

<sup>118</sup> Thomas A. Cardwell III., *Airland Combat: An Organization for Joint Warfare*, (Maxwell AFB, AL: Air University Press, 1992), 50.

<sup>119</sup> Ibid., 101. Based on article by GEN Starry called "Extending the Battlefield," *Military Review*, March 1981, 31-50. Distance based on Corps planning 72 hours and travel time of soviet mechanized units.

<sup>120</sup> Futrell, *Ideas, Concepts, Doctrine 1961-1984*, 551. Later, General Huba Wass de Czega. He was primary author of 1981 version of FM100-5 and is an advisor on current Objective Force doctrine development.

physically throughout the “extended battlefield,” while maneuver and counterattacks would psychologically effect him by attacks against his flanks and lines of communications.

In 1982 the only weapon the corps commander had at his disposal for “deep” attacks was the nonnuclear Lance missile and a limited number of attack helicopters. Therefore, the corps commander would have to rely primarily on Air Force assets for attacks against these follow-on formations. This integration of air-ground attacks beyond the bomblines to attack second echelon forces resulted in the need for additional control and synchronization measures. Two key measures that facilitated, as well as confused implementation of the Active Defense and Airland battle doctrines were the Fire Support Coordination Line (FSCL) and the concept of Battlefield Air Interdiction (BAI).

In 1961, the Army codified its interpretation of the bomblines into a doctrinal term called the Fire Support Coordination Line (FSCL). The 1961 version of FM 6-20-1, *Field Artillery Tactics*, defined the FSCL as “a no-fire line between corps and higher echelons and a bomb line for ground and air forces.”<sup>121</sup> In 1977, under the doctrine of Active Defense, this definition was modified to reflect the heavy reliance of the Army on close air support and the Army’s desire to influence follow-on enemy forces. FM 6-20, *Fire Support in Combined Arms Operations*, redefined the FSCL as “a line beyond which all targets may be attacked *by any weapon system* without endangering friendly troops or requiring additional coordination with the establishing headquarters.”<sup>122</sup> Furthermore, the FSCL “could be considered a dividing line between planned CAS support and air interdiction missions.” This was the first time the FSCL was considered to be a “permissive” control measure allowing “any” surface or air fires beyond it. However, since

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<sup>121</sup> Department of the Army, *FM 6-20-1 Field Artillery Tactics*, 1961, 23.

<sup>122</sup> Department of the Army, *FM 6-20 Fire Support in Combined Arms Operations*, 1977, D-4.

the Army had little ability to influence targets beyond the FSCL, the line served as an unofficial battlefield boundary for targeting and synchronization between the services.<sup>123</sup>

By 1989, AirLand Battle was well established in Army doctrine and corps commanders had the AH-64 attack helicopter and recently developed Army Tactical Missile System (ATACMS) to help shape the deep battle. To reflect this organic deep attack capability, the Army further redefined the FSCL as:<sup>124</sup>

A permissive fire control measure established and adjusted by the ground commander in consultation with superior, subordinate, supporting, and other affected commanders. It is not a boundary; synchronization of operations on either side of the FSCL is the responsibility of the establishing commander out to the limits of the land component forward boundary. It applies to all fires of air, land, and sea weapon systems using any type of ammunition against surface targets. Forces attacking targets beyond the FSCL must inform all affected commanders to allow necessary coordination to avoid fratricide.

While the Army saw the FSCL as a permissive fire control measure, the USAF saw it as a restrictive.<sup>125</sup> To many in the Air Force, all missions short of the FSCL were CAS because these missions required coordination and integration with the ground scheme of maneuver. Instead of having freedom of action to strike targets just beyond Army artillery ranges (such as in WWII and Korea), the USAF now had to coordinate with corps commander for strikes that were a 100 kilometers or more from the nearest friendly troops. To the Air Force, its “battlespace” had been severely restricted. To assist in the determination on the level of control and coordination needed, the concept of Battlefield Air Interdiction (BAI) was introduced.

The RAF and the USAF first introduced the concept of BAI in Europe in the late 1970s in an effort to integrate non-US NATO air forces that refused to conduct CAS inside the FSCL.<sup>126</sup> The 1979 edition of AFM 1-1 identified BAI as “That portion of the air interdiction mission which may have a direct or *near-term* effect upon surface operations and requires the air and

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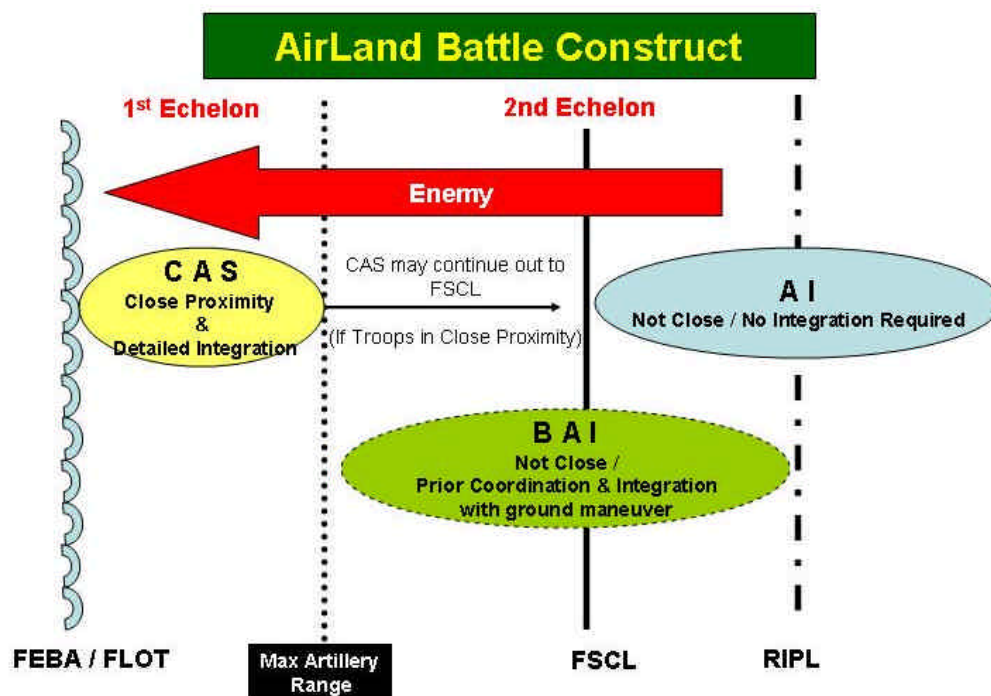
<sup>123</sup> Lt Col Kent Laughbaum, *Synchronizing Airpower and Firepower in the Deep Battle*, CADRE Paper (Maxwell AFB, AL: Air University Press, 1999), 19. Historically established 10-20 km from the FLOT in defensive operations which corresponded to the maximum organic artillery range of the ground forces. Was “pushed” further out during offensive operations so as not to slow down maneuver.

<sup>124</sup> Department of the Army, *FM 101-5-1 Operational Terms and Graphics*, 1997, 1-67.

<sup>125</sup> Lt Col Terry L. New, *Where to Draw the Line between Air and Land Battle*, Thesis (Maxwell AFB, AL: Air University Press, 1996), 6.

surface commanders to coordinate their respective operations to insure the most effective support of the combined arms team.”<sup>127</sup> BAI would occur both forward and rear of the FSCL and did not have to be under the direct control of a forward air controller when delivering ordnance. BAI would be conducted out to the army group/corps reconnaissance and interdiction planning line (RIPL).<sup>128</sup> The air component commander would therefore only be responsible for the interdiction planning of targets beyond the RIPL.<sup>129</sup> Figure 2 illustrates this concept.

**FIGURE 2**



<sup>126</sup> Major P. Mason Carpenter, *Joint Operations in the Gulf War: An Allison Analysis* (Maxwell AFB, AL: School of Advanced Airpower Studies, 1995), 38.

<sup>127</sup> Futrell, *Ideas, Concepts, Doctrine 1961-1984*, 552.

<sup>128</sup> Ibid., 553. Distance to which the group/corps could effectively identify and target enemy formations that may influence close fight; usually out to about 300km and defined the extent of the ground commanders area of interest.

<sup>129</sup> Gonzales, *Tactical Air Support of Ground Forces in the Future*, 60. He obtained this information from the November 1984 Joint Service Agreement on the Joint Attack of the Second Echelon.



COL Robert Rasmussen, of the Air Force Air War College, strongly protested AFM 1-1's fragmentation of BAI and Interdiction. He advocated that "There was no reason to subject interdiction strikes beyond the FSCL to cumbersome procedures necessary for friendly troop safety as in the case of close air support...we have now broken off a piece of the interdiction mission, given it a separate title, and then essentially applied to it the definition of close air support."<sup>130</sup> For the Army, BAI was a tool for the corps commander to shape the battlefield beyond the range of his organic weapons. To many in the Air Force, it was another way for the Army to control more sorties at the expense of air campaign objectives. By 1992, the term BAI had been deleted from Air Force doctrine. In Air Force Terms, air support was now either in front of the FSCL as CAS, or beyond the FSCL as interdiction.<sup>131</sup>

As AirLand Battle continued to evolve in the 1980s, the Air Force agreed to improve its ability to closely coordinate and integrate with the supported ground commander. In 1984 the Chief of Staff Army and USAF signed a memorandum of agreement on thirty-one initiatives to further Air Force-Army cooperation. The services agreed to conduct in-depth review of FAC operations and TACP structure. The review focused on improving GFAC mobility by augmenting the TACP with an Army Helicopter and on supplementing the Battalion FACs with non-rated officers. For the first time, the USAF officially acknowledged that the terminal attack controller could be someone other than an Air Force pilot.<sup>132</sup> As a result of the "initiatives," 1986 became the "year of the FAC." During this year, the USAF launched a five million dollar program to enhance and modernize the Tactical Air Control System (TACS). Instead of helicopters, the TACPs got new Highly Mobile Multipurpose Wheeled Vehicles (HMMWV) and communications gear. More emphasis was added to the training of the ALO and TACP with the establishment of new TACP standards and evaluations programs. The Joint Firepower Control

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<sup>130</sup> Futrell, *Ideas, Concepts, Doctrine 1961-1984*, 552.

<sup>131</sup> Costello, *A Matter of Trust*, 30.

<sup>132</sup> Major Raymond O. Knox, *The Terminal Strike Controller: The Weak Link in Close Air Support*, (Fort Leavenworth, KS: School of Advanced Military Studies, 1989), 37. MAJ Knox's monograph is an excellent reference on the training, equipping, and manning issues of TACPs.

Course was tailored for the training of Air Liaison Officers (ALOs). In addition, the position of Enlisted Terminal Air Controller (ETAC) was created. Now, any member of the team could provide terminal attack control alone or in concert with other team members.<sup>133</sup> To facilitate integration and familiarity, the Battalion ALO's would be designated "by name" to the Army's 225 Active and Reserve maneuver battalions and was required to spend a minimum of 45 days per year with his designated Army unit.

## **Desert Storm**

In August 1990, when Iraq invaded the small country of Kuwait, the U.S. immediately deployed military forces to deter Saddam Hussein from continuing his attack into Saudi Arabia. During the first three weeks of the crisis, the US was only able to deploy a Marine Expeditionary Force (MEF) and an Army Airborne Division into ground defensive positions. Air Force, Navy, and Marine airpower would have been required to conduct extensive close air support and air interdiction operations simultaneously if the Iraqi forces had decided to continue south. Fortunately, Saddam Hussein allowed U.S. and coalition forces to conduct a massive ground and air buildup for offensive operations.

The chain of command established for Desert Shield/Storm went from the president, through the Chairman of the JCS, directly to CINCENT. General Norman Schwarzkopf, the Commander and Chief Central Command (CINCENT), served as both Combined Joint Forces Task Force Commander (CJTF) and Joint Forces Land Component Commander (JFLCC). The land forces in theater worked for the JFLCC and were tasked organized under Army Central Command (ARCENT), Marine Central Command (MARCENT), and the Arab-Islamic Joint Forces Command. For Desert Storm air operations, all theater fixed wing air assets were

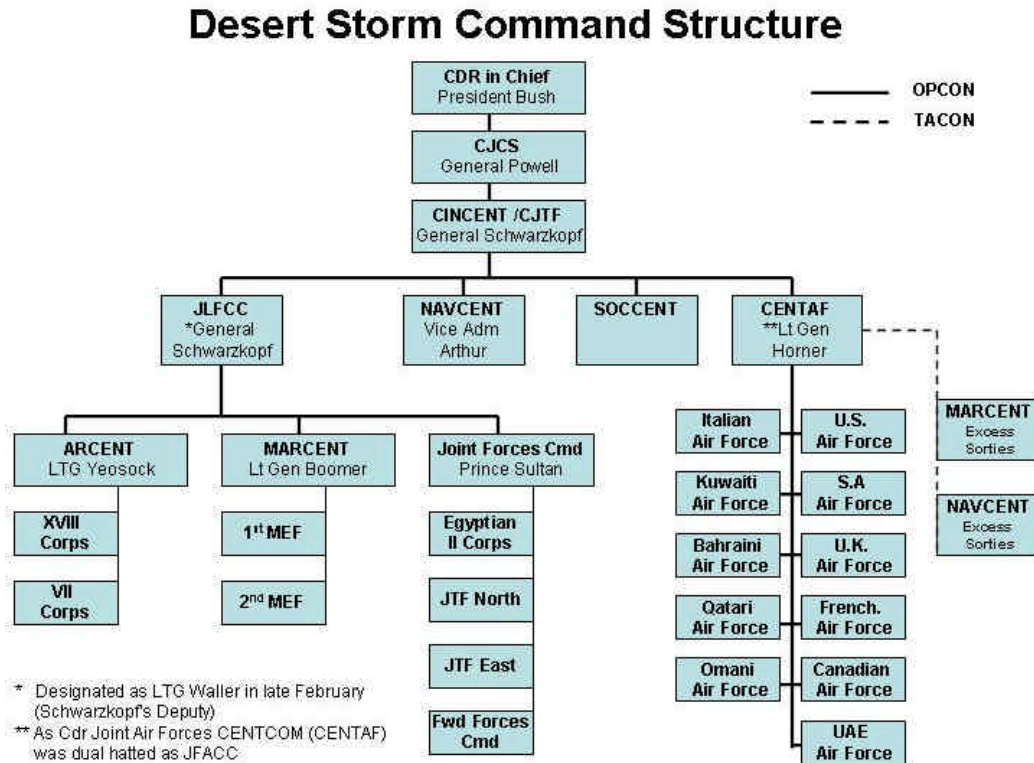
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<sup>133</sup> Ibid., 39; and in *Tactical Air Control System Quarterly*, Report No. 1, April 1986, M-6.

controlled by the Joint Forces Air Component Commander (JFACC), Lt. Gen Charles A. Horner.

Figure 3 outlines the command structure utilized by allied forces during Desert Storm.<sup>134</sup>

FIGURE 3



This policy reflected the lesson of the previous wars and doctrine published in 1986 which established the need for a single air manager during joint air operations whose priorities are set the JTF/Theater Commander.<sup>135</sup> General Horner maintained operational control of Air Force units, to include Strategic Air Command (SAC) bombers, and tactical control of specified Navy and Marine sorties. The Navy/Marines agreed to make sorties available to the JFACC after their requirements for fleet protection and CAS had been met. The Navy/Marine agreement to provide “excess” sorties to the JFACC was in line with the 1980 Omnibus agreement on the

<sup>134</sup> Bruce W. Watson and Bruce George, *Military Lessons of the Gulf War* (Novato, CA: Presidio Press, 1991), 137.

<sup>135</sup> Cardwell, *An Organization for Joint Warfare*, 138. See also Joint Pub 3-01.2.

command and control of USMC TACAIR during sustained operations ashore. This agreement was later codified into joint doctrine.<sup>136</sup>

The Marine Air/Ground Task Force (MAGTF) commander will retain operational control of his organic assets. The primary mission of the MAGTF air combat element is the support of the MAGTF ground element. During joint operations, the MAGTF air assets unit normally will be in support of the MAGTF mission. The MAGTF Commander will make sortie available to the JTF Commander, for tasking through his air component commander for air defense, long-range interdiction, and long-range reconnaissance. Sorties in excess of MAGTF direct support requirements will be provided to the Joint Forces Commander for tasking through the air component commander for the support of other components of the joint force or the joint force as a whole. Nothing herein shall infringe on the authority of the Theater or Joint Force Commander in the exercise of operational control, to assign missions, redirect efforts...and direct coordination among his subordinate commanders to insure unity of effort in accomplishment of his overall mission, or to maintain integrity of the forces, as prescribed in JCS Pub 2.

To control, coordinate, and synchronize the air operations, the Air Force Tactical Air Control System was modified into Theater Air Command and Control Center (TACC), with the other services and coalition forces providing liaisons to it. This allowed the TACC to control both battlefield and strategic air attacks.<sup>137</sup> As in Vietnam, Air Support Operations Centers (ASOCs) and Marine Direct Air Support Centers (DASC) were established with each corps equivalent. General Schwarzkopf also established a Joint Target Coordination Board (JCTB) in late February to ensure that the objectives of the air campaign and the needs of all service components were better integrated.

The coalition air forces conducted an air campaign from 17 January to 24 February to gain air superiority, conduct strategic attacks against critical command and control facilities and weapons of mass destruction (WMD) capabilities, interdict Iraqi lines of communications into Kuwait, and attrite Iraqi mechanized forces. To facilitate these objectives, the Saudi border with Iraq and Kuwait was both the Forward Line of Troops (FLOT) and the FSCL until the

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<sup>136</sup> Joint Chiefs of Staff, *JP 0-2 Unified Action Armed Forces* (Washington D.C.: US Government Printing Office, 1995), IV-4. Army helicopters fall under a similar arrangement in JP 0-2.

<sup>137</sup> Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey (GWAPS) Summary Report* (Washington D.C.: US Government Printing Office, 1993), 147.

commencement of ground operations.<sup>138</sup> On D-Day (24 February 1991) the FSCL was placed 15-20 kilometers in front of the FLOT. The plan was for the FSCL to be advanced one phase line at a time as the ground forces advanced. Due to the rapid movement of ground forces, by the third day of the offensive the FSCL was placed north of the Euphrates River (over 100 kilometers in front of friendly troops).

To the Army, extending the FSCL gave the corps commanders a greater ability to rapidly shape the battle by nominating distant targets for CAS instead of utilizing the less responsive and drawn out procedures for gaining BAI and AI sorties.<sup>139</sup> The corps commanders could also utilize their ATACMS and Apache attack helicopters without having to first coordinate with the JFACC. Although the FSCL was designed as a permissive measure and not a boundary, General Schwarzkopf had restricted ground forces from attacking targets beyond the FSCL unless they were first cleared by the JFACC. The VII Corps Artillery commander, General Abrams complained that the USAF was using the FSCL in a restrictive manner preventing the timely execution of deep fires and attack helicopter attacks. 1<sup>st</sup> Cavalry Division made a similar observation stating that “Fire support measures were not doctrinally applied...the FSCL was positioned to close and used as a restricted fire line” and “the division commander was denied the ability to direct artillery fires onto his priority targets.”<sup>140</sup> The speed of the advance also made it difficult for the ground headquarters to maintain awareness on the actual location of the FLOT. With an increasing concern over potential fratricide and a desire to retain freedom of action, it made sense to the ground commanders to move the FSCL as far forward as possible.<sup>141</sup>

The JFACC viewed the FSCL as a restrictive measure. General Horner had convinced Schwarzkopf that the FSCL had to be a restrictive control measure in order to synchronize deep

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<sup>138</sup> Forward Line of Own Troops (FLOT) as defined in *JP 1-02 Joint Terms and Definitions* — A line which indicates the most forward positions of friendly forces in any kind of military operation at a specific time. The FLOT normally identifies the forward location of covering and screening forces.

<sup>139</sup> Costello, *A Matter of Trust*, 29.

<sup>140</sup> Laughbaum, *Synchronizing Airpower and Firepower in the Deep Battle*, 35.

<sup>141</sup> Richard M. Swain, *Lucky War, Third Army in Desert Storm* (Fort Leavenworth, KS: US Army Command and General Staff College Press, 1994), 227-228.

operations and prevent surface-to-air and fighter-to-helicopter fratricide.<sup>142</sup> In addition, JFACC policy during the war was that all fixed wing air attacks short of the FSCL required either a ground or airborne controller to direct the strikes.<sup>143</sup> This was because General Horner had eliminated BAI as an air mission type for CENTCOM. He saw BAI as unnecessary and a type of air mission that would complicate and potentially degrade the application of air power on the battlefield.<sup>144</sup> Therefore, to the JFACC, moving the FSCL 100 kilometers in front of the nearest friendly troops provided Iraqi forces a “sanctuary” from ground forces organic weapons and rapid air attack by the JFACC. As a future Air Force Chief of Staff explained, “If the FSCL is established too far out, you slow and reduce air power’s access to enemy targets...If the FSCL is so far forward that ground troops don’t have the sufficient organic sensors and shooters to cover the targets, then you give the enemy a sanctuary...Air component assets can’t attack targets inside the FSCL without tremendous coordination.”<sup>145</sup> This sanctuary was claimed to have allowed several Republican Guard units to escape north across the Euphrates River unhindered by air attack. Without the restrictive policy established by the JFACC on control of air attacks short of the FSCL, this sanctuary would probably not have existed. Nevertheless, the FSCL was pulled back several hours later after complaints from the JFACC.<sup>146</sup>

The actual employment of CAS in the Gulf War can best be compared to the Allied breakout from the Normandy hedgerows in 1944.<sup>147</sup> Then, as well as in 1991, U.S. forces conducted a ground offensive of rapid movement with CAS sorties operating under the “push CAS” system. This was in direct contradiction of Air Force policy during the Korean and Vietnam Conflicts. To insure the responsive requested by the ground commanders, General Horner had decided to maintain on-station airborne alert CAS sorties which were diverted to

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<sup>142</sup> Laughbaum, *Synchronizing Airpower and Firepower in the Deep Battle*, 35.

<sup>143</sup> Keaney, *GWAPS Report*, vol. 2, pt. 2, 314.

<sup>144</sup> Major P. Mason Carpenter, *Joint Operations in the Gulf War: An Allison Analysis* (Maxwell AFB, AL: School of Advanced Airpower Studies, 1995), 38.

<sup>145</sup> General Ronald R. Fogleman, “Making the Most of Air Power,” *Field Artillery*, Sep-Oct 1996, 4.

<sup>146</sup> Kearney, *GWAPS Summary*, 156. Was pulled back 15 hours later.

<sup>147</sup> Costello, *A Matter of Trust*, 55.

alternate preplanned interdiction targets if the ground commander had no need for the aircraft.<sup>148</sup> Other CAS aircraft remained on ground alert and were scrambled if needed. Flights would arrive within the anticipated target area and be rotated out as frequently as every seven minutes under the control of the Airborne Battlefield Command and Control Center (ABCCC). Upon arriving on station, the fighters would check in with the corps ALOs to see if they had any targets. If not, they were retasked to interdiction by the ABCCC to preplanned targets or into “Kill Boxes.”<sup>149</sup> A Kill Box was a thirty by thirty nautical mile square drawn on maps to orient attacking aircraft. Each square was further subdivided into four fifteen-by-fifteen mile squares. Sometimes aircraft had a preplanned target in the square, at other times it would simply target “plink.”<sup>150</sup>

Due to the disruption of the Iraqi defenses and superiority of the U.S. M1A1 tank over the Iraqi T-72, ground forces rarely needed CAS for targets within range of their direct fire systems. In a 1994 interview on CAS during use Desert Storm, General Franklin Franks, the VII Corps commander, had the following to say:<sup>151</sup>

The closest thing we had to classical, you know, National Training Center type, close air support was with the 2nd Cavalry. They were the covering force, and they had what we visualize close air support to be—aircraft attacking targets that are in the same battle space as ongoing direct fire engagements...Our direct fire systems were doing fine in that kind of exchange, and where we needed the air was a little deeper. We had a rolling, attacking mechanism. That's the way the commanders tended to use it. If we would have focused it all up close, you would have stopped the momentum of the ground attack, because of fratricide and so forth. So to keep the momentum of the ground attack moving, the divisional commanders pushed the close air support deeper

Fixed wing CAS sorties did not attack targets within five kilometers or more of ground troops for fear of fratricide.<sup>152</sup> Instead, ground commanders relied heavily on Army attack helicopters (AH-64) and Marine AH-1 Cobras for close air support missions within the ground forces direct and indirect weapons ranges. In the area of XVIII Airborne Corps, the AH-64s also engaged in

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<sup>148</sup> Kearney, *GWAPS Summary*, 51.

<sup>149</sup> Costello, *A Matter of Trust*, 48.

<sup>150</sup> Kearney, *GWAPS Summary*, 52. Target plinking was term coined for searching for individual tank targets by coalition aircraft, primarily the A-10.

<sup>151</sup> Mason P. Carpenter, *Joint Air Operations in the Gulf War: An Allison Analysis* (Maxwell AFB, AL: Air University Press, 1995), 59-60. GEN Frederick Franks interview with Major P. Mason Carpenter on 23 March 1994.

<sup>152</sup> Costello, *A Matter of Trust*, 49.

several independent deep operations (50+ kilometers) against withdrawing Iraqi forces. As a result of these operations, Army helicopters fired more than 2000 Hellfire missiles during the 100 hour ground war.<sup>153</sup>

The Army was basically satisfied with quantity and quality of CAS they had received during the 100 hour ground offensive. They had their own attack helicopter, a dedicated Air Force fixed wing CAS aircraft (the A-10), and a continuous flow of airborne sorties that could quickly respond when needed. What Army corps commanders and ARCENT were not satisfied with was their ability to shape the battlefield with BAI and/or CAS prior to the ground offensive. General Franks, VII Corps commander, complained that only 300 of his 2000 nominated targets had been attacked by the JFACC. XVII ABN Corps expressed similar concerns. On 18 February, ARCENT forwarded the following message to CINCENT expressing its dissatisfaction over the apportionment of air sorties:<sup>154</sup>

Air support related issues continue to plague final preparation for offensive operations and raise doubts concerning our ability to effectively shape the battlefield prior to initiation of the ground campaign. Too few sorties are made available to VII and XVII ABN Corps. While air support missions are being flown against 1<sup>st</sup> echelon enemy divisions, Army nominated targets are not being serviced. Efforts must be taken now to align the objectives of the air and ground campaigns and ensure the success of our future operations.

The air and ground commanders had all agreed that the air campaign was to be a phased operation with an intensive nine to eight day preparation of the battlefield prior to commencement of the ground offensive. The JFACC was following the theater commander's guidance on sortie apportionment and was focused on the objectives that had been established for airpower in the initial phases of the operation. Unfortunately, no one knew exactly when the ground offensive would occur, so when to begin this eight to nine day prep was in doubt. After receiving the complaints and re-assessing the situation, it seems that General Schwarzkopf changed the air

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<sup>153</sup> Kearney, *GWAPS Summary*, 204.

<sup>154</sup> *Ibid.*, 189.



priorities. The next day, 19 February, ARCENT received 432 sorties, the most to date. This rate of 400+ sorties to ARCENT was maintained thru D-DAY.<sup>155</sup>

By February 1991, the Army and the Air Force were better prepared to conduct CAS before a conflict than at any other time in history. The training, doctrine, and equipment developed and acquired over the 1970s and 80's was a direct result of the close cooperation between the services after the Vietnam War and their goal of being able to defeat the Soviet Union without the use of strategic nuclear weapons. Out of the 10,000 ground attack sorties conducted during the war, 2500 of these were classified as CAS (25%).<sup>156</sup> The majority of these were diverted to interdiction targets when not needed by the ground commander. As a result, less than 10% of sorties during Desert Storm were actually used for CAS missions. This statistic resulted from a variety of factors, not the least of which was that coalition forces faced a second rate enemy whose "will" had been broken by the 40+ day air campaign. Coalition forces also enjoyed an overwhelming advantage in training, intelligence, and the ability to command and control its forces. The Iraqi main battle tank, the T-72, was no match in a fight against the M1A1 with its superior optics, thermal sight, and stabilized gun. As a result, U.S. and coalition ground forces had little need for CAS within the range of their organic weapons and artillery.

Just as in the previous wars, disagreements between the ground and air components over the allocation, control, and effectiveness of CAS continued to exist. Failure to apply doctrine in some cases and differences in interpretation of doctrine in others contributed to this friction. These disagreements though, did not prevent the services from reaching workable and effective arrangements for the employment of CAS during Operation Desert Storm. Although many have claimed that Desert Storm was the "model" for future war and that there would be little need for CAS in the future, the "war on terrorism" in Afghanistan has proven once again the utility of being able to effectively employ CAS.

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<sup>155</sup> Kearney, *GWAPS Summary*, 189.

<sup>156</sup> James A. Winnefeld, Preston Niblack, and Dana J. Johnson, *A League of Airmen: U.S. Air Power in the Gulf War* (Santa Monica, CA: RAND, 1994), 84.

## Historical Summary

Given what we have learned about the history of CAS, will it be when and where it's needed during Objective Force Operations? The historical analysis demonstrated that given sufficient time, the services will eventually work out deficiencies in existing doctrine. Objective Force Concepts though, do not allow time for "working-out" doctrinal disconnects. We have to get it right the first time. Unfortunately, even during Desert Storm, when CAS doctrine, organizations, and equipment were better prepared for war than at any other time in history, there were problems. Fratricide still occurred, CAS was restricted from striking targets closer than five kilometers to friendly troops, and doctrinal differences on the placement of the FSCL and use of BAI contributed to the unhindered withdrawal of some Iraqi units across the Euphrates River. Fortunately, the enemy put up little resistance and CAS was not needed nor challenged as much as it potentially could have been.

The key issues of debate between the services that are most likely to affect Objective Force operations have revolved around who should control CAS aircraft, how CAS should be used, and what type of aircraft should conduct it. In Korea, the doctrine supported CAS as a tactical asset to augment Army and Marine organic fires against enemy forces within the bombline. There was no single air manager. The USAF and Navy/Marines each controlled their own aircraft. Air Force priorities in Korea were Air Superiority, interdiction, and then CAS with whatever sorties were left over. Therefore, CAS sorties had to be "pulled" when needed by Army ground forces. When the aircraft arrived, they were directed to their targets by Air Force ground or air terminal controllers. The Korean system proved to be unresponsive and unpopular with ground commanders. The Army wanted more assurance that CAS would arrive when requested. The Army eventually trained and equipped its own TACPs to augment those of the Air Force.

By the later half of the Vietnam War and during Desert Storm, fixed wing sorties of all the Service's were under the control of a single air manager to a certain degree. The

Navy/Marines had secured agreements that its aircraft were to first be used for fleet protection and Marine CAS, with any leftover sorties then being distributed by the JFACC. These allocated Marine and Air Force sorties were all considered CAS missions in South Vietnam with seventy percent of these sorties distributed to corps for preplanned direct support of brigade and battalion search and attack missions. The remaining thirty percent were retained by the Joint Force Commander as emergency CAS. By Desert Storm, approximately twenty-five percent of JFACC sorties were allocated as CAS and these were mostly utilized by corps commanders to shape the battlefield beyond ground forces tube artillery ranges. During both Vietnam and Desert Storm, these sorties were normally directed to their targets by Air Force and Marine Tactical Air Controllers. This was possible because by 1965, the Air Force had placed TACPs with each maneuver battalion. This arrangement facilitated airpower integration and coordination with ground forces scheme of maneuver and increased the likelihood that the TACP would be in a position during combat to observe and provided terminal guidance control for CAS missions.

Army and Marine helicopters were the exception to airpower under a single air manager. They remained under the direct control of ground commanders throughout Vietnam and Desert Storm. In Vietnam, armed helicopters were primarily used as aerial fires support in close proximity to troops. By Desert Storm, rotary wing aircraft were attacking targets in close proximity to troops as well as enemy forces deep (50+ kilometers from the FLOT) within the ground commanders AO.

## **Implications for the Objective Force**

The historical trend seems clear. Fixed wing CAS sorties operating under the terminal control of a FAC(A) are being utilized deeper and deeper in the ground commanders AO to shape the conditions for a successful close fight. Fixed wing CAS sorties in close proximity to troops have mainly been used only in emergency situations or when it has been carefully planned. Army helicopters have been utilized primarily within tube artillery ranges as a separate maneuver

element or in direct aerial fire support of ground attacks. For the majority of Objective Force operations, unless this trend is reversed, Units of Action *will not* have fixed wing CAS in direct support of Red Zone battles. Instead, Units of Employment will use the majority of allocated fixed wing CAS sorties to shape the battlefield outside of Red Zones. This implies that if CAS/direct aerial fire support is needed in support of Units of Action Red Zone attacks, the Objective Force will need to have sufficient organic attack helicopters or armed UAVs to provide that support.

History has also shown that the Air Force will not be receptive to a revision in doctrine that demands a greater degree of integration and employment of airpower in support of ground operations. The Air Force wants to have the freedom of action to conduct an air campaign in support of the Joint Force Commander's priorities. They believe that CAS is the least effective use of airpower to obtain lasting effects on the battlefield. The Air Force will continue to advocate joint doctrine where airpower is centrally controlled and distributed to Units of Employment based on the Joint Force Commander's priorities. Therefore, it is not likely that Units of Employment will have operational control of distributed CAS sorties even though integration and coordination of these assets into the Objective Force scheme of maneuver will be more important and more difficult than in traditional 20<sup>th</sup> Century linear battles. Without operational control of these assets, the Objective Force must insure that it has/maintains the proper USAF/Joint personnel, equipment, and C2 systems to facilitate the detailed integration that will be necessary.

With widely dispersed Red Zone battles occurring simultaneously, the likelihood that the one Air Force TACP assigned to a Unit of Action battalion will be in position to provide terminal air control is remote. In Vietnam and Desert Storm, they had trouble enough. The Air Force will not add additional ground terminal controllers to Objective Force Units of Action. One TACP per maneuver battalion is expensive and difficult enough for the Air Force to staff and

maintain.<sup>157</sup> Therefore, Army personnel may be required to conduct terminal control of CAS sorties during Objective Force operations. The successful use of Army manned TACPS was demonstrated in Korea. Additionally, Air Force enlisted personnel with terminal air control training have been very effective in providing terminal guidance for CAS aircraft for the last fifteen years. When Air Force controllers are not available or not in a position to observe the mission, specified Army personnel must have the training and equipment to provide terminal guidance. Without this capability, the Objective Force greatly increases its risk of fratricide in Red Zone engagements. The Comanche helicopter, with its joint integration capabilities between Units of Actions and joint forces, is the most likely candidate from which this terminal air control will be conducted.<sup>158</sup>

The Air Force has consistently resisted developing and fielding a single purpose CAS aircraft. Therefore, the Objective Force will have only improved versions of existing aircraft as CAS platforms in 2015. The A-10, which is the only single purpose CAS aircraft the Air Force has ever built, will be retired sometime between 2014 and 2026. The Air Force currently has no plans to build another single purpose CAS aircraft. This leaves the F-16 and Joint Strike Fighter (JSF) as the primary CAS fixed wing platforms in 2015. If the Army wants a single purpose CAS aircraft to support the Objective Force, it will have to build it. Therefore, the Army should maximize its organic CAS capability (AH-64, Comanche, & armed UAVs) and increase its participation in the requirements determination for F-16 and Joint Strike Fighter CAS capabilities.

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<sup>157</sup> Air Force has, and continues to experience difficulties filling/retaining TACP manning. Also experiences high turn-over rate. FACs are often brand new pilots who have little experience/knowledge on airpower besides “flying the plane.” Refer to MAJ Raymond O. Knox’s monograph on *Terminal Air Controllers* for more information on this issue.

<sup>158</sup> Department of the Army, *Draft RAH-66 Comanche Operational Requirements Document*, (Fort Rucker, AL: TSM Comanche, 2001), 6.

## IV. CLOSE AIR SUPPORT DOCTRINE

### Current Doctrine and Use

*CAS produces the most focused but briefest effects of any counterland mission; by itself, it rarely achieves campaign-level objectives. However, at times it may be the more critical mission by ensuring the success or survival of surface forces. CAS should be planned to prepare the conditions for success or reinforce successful attacks of surface forces. CAS can halt attacks, help create breakthroughs, cover retreats, and guard flanks. To be most effective, however CAS should be used at decisive points in a battle and should normally be massed to apply concentrated combat power and saturate defenses....*

AFDD1 (Basic Air Force Doctrine) pg 50

*...All of these benefits of CAS must be weighed against the other, potentially more effective, uses for CAS-capable assets such as AI or even strategic attack. The ground commander should use his organic firepower whenever possible before calling in requests for CAS.*

AFDD2-1.3 (Counterland Doctrine) pg 36

The above statements reflect the current view of the Air Force on close air support. CAS is strictly a tactical mission with limited objectives and limited results. If given a choice, the Air Force would only do CAS in extremis. On at least three separate occasions since World War II, the Air Force has tried to dissolve itself of the CAS mission.<sup>159</sup> The most recent occasion occurred in 1994 when then Air Force Chief of Staff General Merrill McPeak expressed his view of the declining role and need for CAS and promoted “the elimination of CAS as a primary responsibility for the Air Force and Navy.”<sup>160</sup> The official position of the Air Force to the *Congressional Roles and Missions Debate on the Adequacy of Joint Close Air Support Training, Doctrine, and Procedures* was that attack and scout helicopters operating in close coordination with ground units are the optimal CAS asset and that fixed wing aircraft should only be used for emergency backup.<sup>161</sup> Consequently, the Air Force proposed that it should eliminate the A-10

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<sup>159</sup> In 1956, 1988, and in 1994.

<sup>160</sup> Keithly, “Revamping Close Air Support,” 14.

<sup>161</sup> General Accounting Office, “Combat Airpower: Assessment of Joint Close Support Requirements and Capabilities is Needed,” *Report to Congressional Committees* (Washington D.C.: US Government Printing Office, June 1996), 28.

from its inventory as soon as possible and that the CAS mission be downgraded to a collateral function. When a new Air Force Chief took over less than a year later, the Air Force reversed its stance and told the Commission that it believes “fixed-wing CAS is still required and that it therefore intends to retain primary CAS responsibilities and the means to execute them.”<sup>162</sup> The Army acknowledged to the commission that its increased capabilities and firepower in the close fight had “substantially reduced the need for fixed wing fire support.”<sup>163</sup> However, the Army argued that fixed wing CAS was an important capability that should be retained, especially for early entry operations and under circumstances when close support targets exceed the range of land-based systems, and/or when special munitions are required. Inevitably, the Army, Air Force and congress have recognized CAS as a responsibility of all the Services.

Joint Publication 3-09.3, *Joint Tactics, Procedures, and Techniques for CAS*, acknowledges that close air support is a tactical level operation, but advocates that it is “linked to the operational art though the air apportionment process.”<sup>164</sup> Current Army manuals view CAS in much the same way as the Air Force. The 1993 version of Army FM 100-5, *Operations*, states:<sup>165</sup>

CAS supports land operations by providing the capability to deliver massed firepower at decisive points and attacking hostile targets in close proximity to friendly forces with preplanned or immediate attacks. CAS can surprise the enemy, create opportunities for the maneuver or advance of friendly forces through shock action and concentrated attacks, protect the flanks of friendly forces, blunt enemy offensives, and protect the rear of land forces during retrograde operations.

The new Army Operations manual, FM 3-0, only mentions CAS in that “the effectiveness of air interdiction and close air support depends, to a large degree, on integrating land maneuver with the joint force concept of operations.”<sup>166</sup> Marine Corps manual MCWP 3-23.1, *Close Air Support*, advocates that “The Marine Corps fights using maneuver warfare through the application of

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<sup>162</sup> Ibid., 29.

<sup>163</sup> Ibid., 28.

<sup>164</sup> Office of the Chairman, Joint Chiefs of Staff, *Joint Publication 3-09.3 JTTP for Close Air Support* (Washington, D.C.: United States Government Printing Office, 1995), 1-1.

<sup>165</sup> Department of the Army, *FM 100-5 Operations* (Washington, D.C.: United States Government Printing Office, June 1993), 2-19.

<sup>166</sup> Department of the Army, *FM 3.0 Operations* (Washington, D.C.: United States Government Printing Office, June 2001), 2-7.

combined arms. CAS is fully integrated with other supporting arms to support the MAGTF commander's plan. The MAGTF commander uses CAS at the decisive place and time to achieve local combat superiority or take advantage of battlefield opportunities. CAS is a mission conducted at the tactical level that may affect *operational-level* objectives.”<sup>167</sup>

FM 100-7, *The Army in Theater Operations*, uses the term “operational fires” to describe the application of lethal and nonlethal firepower to achieve a decisive impact on the conduct of a campaign or major operation.<sup>168</sup> Operational fires includes both the targeting and attack of land and sea targets whose destruction or neutralization will have a significant impact on a campaign or major operation. Operational firepower is not fire support.<sup>169</sup> It achieves operational objectives by extending the battlefield in both space and time to disrupt enemy capabilities *before they can be used against friendly forces*. Operational fires are normally used to facilitate maneuver, isolate the battlefield, or destroy critical enemy functions and capabilities. Based on this definition of what constitutes operational fires, is CAS an operational or tactical asset or both? Does it matter?

To determine how doctrine views CAS today and how it is actually being used, we must first compare and contrast CAS with Air Interdiction (AI). Joint doctrine defines CAS as “air action by fixed and rotary-wing aircraft against hostile targets which are in *close proximity* to friendly forces and which *require detailed integration* of each air mission with the fire and movement of those forces.”<sup>170</sup> AI is defined as “Air operations conducted to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required.”<sup>171</sup> The Air Force manual, *Counterland*, expands this definition further and says that:<sup>172</sup>

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<sup>167</sup> Headquarters, United States Marine Corps, *MCWP 3-23.1 Close Air Support* (Washington D.C.: United States Government Printing Office, July 1998), 1-1.

<sup>168</sup> Department of the Army, *FM 100-7 Decisive Force: The Army in Theater Operations* (Washington, D.C.: United States Government Printing Office, May 1995), 5-3.

<sup>169</sup> *Ibid.*, 7-4.

<sup>170</sup> Office of the Chairman, Joint Chiefs of Staff, *JP 1-02 Joint Terms and Definitions*, 98.

<sup>171</sup> *Ibid.*, 23.

<sup>172</sup> Dept of the Air Force, *AFDD 2-1.3 Counterland* (Washington, D.C.: Government Printing Office, 1999), 23.



AI is employed to destroy, disrupt, divert, or delay the enemy's surface military potential *before* it can effectively engage friendly forces, or otherwise achieve its objectives... This minimizes the risk of *fratricide* against friendly ground forces and reduces the *need to deconflict* between aerospace maneuver forces and organic surface fires.

The enemy's "close proximity" to ground forces and the level of "detailed integration" between the air and ground components are the key concepts that seem to separate CAS from Air Interdiction. The Air Force's expanded explanation of AI also implies that "when" the effects of air-to-ground attacks are felt is another key distinguishing characteristic.<sup>173</sup>

*Counterland* says that close proximity "refers to the distance within which some form of terminal control is required for targeting direction and fratricide prevention." Army manual FM 6-20, *Fire Support for Corps and Division Operations*, defines close proximity as when "Friendly forces and/or noncombatants are close enough to the target that *care* must be taken to avoid casualties from air-delivered weapons effects."<sup>174</sup> What is considered to be sufficient "care" is left up to the ground commander. Joint doctrine specifies that the word "close" does not imply a specific distance; rather, it is situational.

Detailed integration is described in *Counterland* as the "level of coordination required to achieve the desired effects without overly restricting CAS attacks, surface firepower, or the ground scheme of maneuver...the maximum range requiring detailed integration is typically bounded by the range at which organic surface firepower provides the preponderance of effect on the enemy." Joint doctrine says that proximity, fires, or movement is the determining factor for detailed integration.<sup>175</sup> JP 3-09.3, *JTTP for Close Air Support*, also outlines several procedural concepts and considerations required for the detailed integration of CAS with the fire and

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<sup>173</sup> Department of the Air Force, *AFDD 2-1.3 Counterland*, 4.

<sup>174</sup> Department of the Army, *FM 6-20 Fire Support for Corps and Division Operations* (Washington, D.C.: United States Government Printing Office, 1989), 3-3.

<sup>175</sup> Joint Chiefs of Staff, *JP 3-09.3 JTTP for Close Air Support*, 2-1.

maneuver of the supported unit.<sup>176</sup> Army doctrine does not address what constitutes detailed integration beyond what is described in JP 3-09.3.

Now that we have a better understanding of detailed integration and close proximity and its relation to CAS and AI, how do we classify missions that attack targets/enemy formations that are not in close proximity to friendly forces but still require some form of integration with the ground commander's fire and maneuver plan? In the AirLand Battle days, we classified this situation as a Battlefield Air Interdiction (BAI) mission. BAI was AI attacks against those forces not in close proximity but that may have "near-term" effect on the scheme of maneuver of friendly forces.<sup>177</sup> Today, this situation is not doctrinally addressed.<sup>178</sup>

In today's doctrine, CAS and AI are conducted both forward and rear of the FSCL. A fire support coordination line is not required, but is usually established by the ground or JTF commander to insure coordination of fires and interdiction not under the ground commanders' control that may directly affect his current operation.<sup>179</sup> All missions short of the FSCL will typically require check in with the air-to-ground Theater Air Control System (TACS) while en route to the target for an update on potential targets, surface-to-air threats, and friendly troop locations.<sup>180</sup> CAS missions are normally handed off to a TACP or FAC(A) for terminal attack control. AI missions short of the FSCL usually only require clearance into specified target areas using procedural control to deconflict with ground maneuver and fires. Pre-coordinated and deconflicted "Kill Boxes" are established to facilitate rapid air-to-ground attack and serve as alternate target areas for CAS sorties that could not be utilized by the ground commander. This type of mission that is planned against a particular area, rather than a particular target is often

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<sup>176</sup> Contained in the DRAFT version of Joint Chiefs of Staff, *JP 3-09.3 JTTP for Close Air Support*, 5-1; This version is scheduled for publication in 2003.

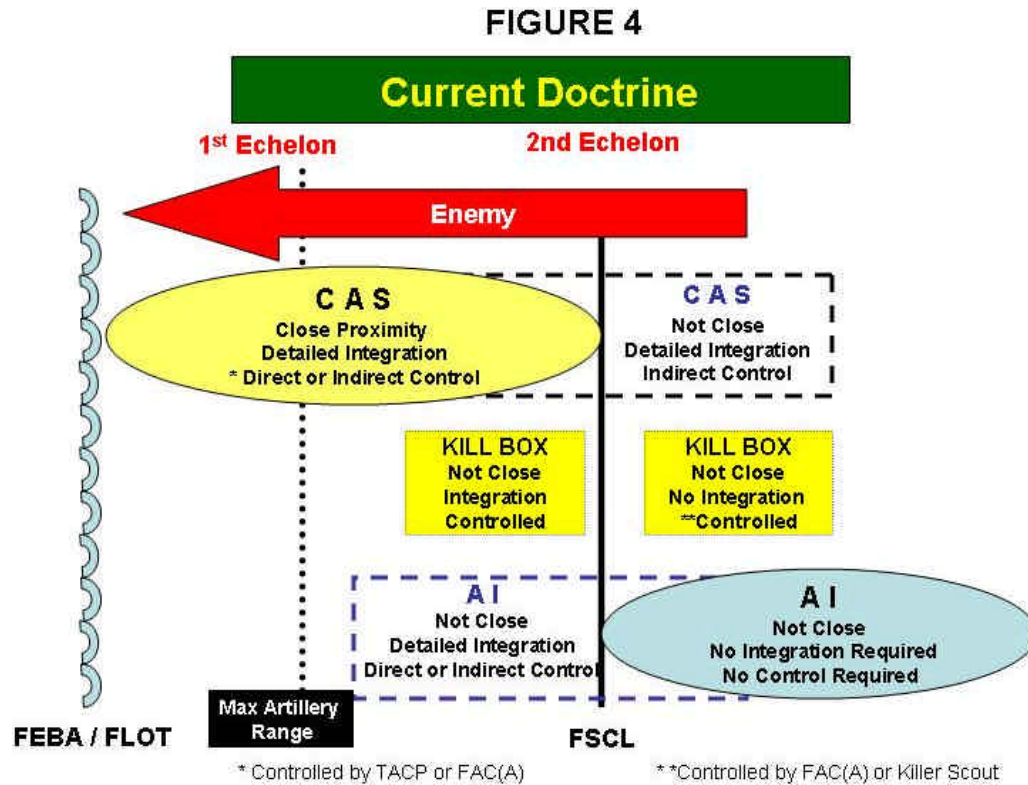
<sup>177</sup> Department of the Army, *FM 6-20 Fire Support for Corps and Division Operations*, 3-2.

<sup>178</sup> Air Combat Command, *Joint Firepower Control Course Brief*, CAF Weapons and Tactics Conference, 8 Dec 2000, slide 15, online source, accessed 20 Feb 2002; available from Air Combat Command Homepage (web address classified secret); SIPRNET.

<sup>179</sup> Department of the Army, *FM 100-15 Corps Operations* (Washington, D.C.: United States Government Printing Office, 1996), 2-6.

<sup>180</sup> Department of the Air Force, *AFDD 2-1.3 Counterland*, 4.

referred to as “flexible” AI.<sup>181</sup> Figure 4 illustrates the battlefield framework for how CAS and AI are employed in joint doctrine today.



Currently, the type of control procedures utilized for CAS missions vary based on the close proximity of friendly troops, the impact of CAS missions on friendly fire and movement, and/or which side of the FSCL the mission is conducted. The two current doctrinal control procedures for CAS are positive control and reasonable assurance.<sup>182</sup> Positive control is conducted when it is necessary for either a ground or airborne controller to provide terminal guidance for, or grant release authority to, a CAS aircraft. Positive control is further divided into direct and indirect. Direct positive control is the most restrictive and is normally used when troops are in contact with enemy forces. It requires that the terminal attack controller be able to observe the desired target and attacking aircraft to ensure that friendly forces will not be engaged. Indirect positive control

<sup>181</sup> Ibid., 27.

<sup>182</sup> Joint Chiefs of Staff, *JP 3-09.3 JTTP for Close Air Support*, V-9.

is used when the terminal attack controller can not observe the target himself, but is in contact with a trained observer who can.<sup>183</sup> Reasonable assurance guidelines are established by the Joint Force Commanders to allow aircrews to continue attacks on targets when positive control requirements cannot be met. Under reasonable assurance, attacks can continue if the maneuver force commander, terminal controller, and aircrew are confident the attack will achieve objectives without harming friendly forces.<sup>184</sup> In the September 2001 draft revision of JP 3-09.3, direct positive control, indirect positive control, and reasonable assurance have been replaced with the terms type one, type two, and type three controls respectively. Their meanings/use has not been significantly altered. In all occasions, the ground commander retains the ability to change the type of terminal control guidance based on his risk assessment. These control measures were designed with the goal of preventing fratricide while allowing terminal air controllers (TACs) the flexibility to engage targets as they present themselves in accordance with the maneuver force commander's intent.<sup>185</sup>

Under current doctrine, Army aviation units are normally tasked through mission-type orders passed to a battalion or cavalry aviation squadron, which then executes the mission as an integral unit/maneuver element of the ground commander.<sup>186</sup> Aviation units maneuver throughout the depth of the battlefield (both forward and short of the FSCL) using their organic firepower to shape the battlespace or to provide the *decisive component* of the ground commander's combat power.<sup>187</sup> Although they can perform CAS missions in smaller groups, the preferred employment of Army attack helicopters is as an integral unit, operating under the control of a maneuver commander.<sup>188</sup> When employing Army helicopters in a CAS role, the doctrinal nine-line CAS request format and types of control procedures for fixed wing aircraft are rarely used. One reason

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<sup>183</sup> Observer may be a scout, COLT, FIST, UAV, SOF, or other C4ISR asset; in JP 3-09.3, V-10.

<sup>184</sup> Joint Chiefs of Staff, JP 3-09.3 JTTP for Close Air Support, V-10.

<sup>185</sup> DRAFT version of Joint Chiefs of Staff, JP 3-09.3 JTTP for Close Air Support, V-18.

<sup>186</sup> Joint Chiefs of Staff, JP 3-09.3 JTTP for Close Air Support, III-6.

<sup>187</sup> Department of the Army, FM 1-100 Army Aviation (Washington, D.C.: United States Government Printing Office, 1997), 2-1.

<sup>188</sup> Joint Chiefs of Staff, JP 3-09.3 JTTP for Close Air Support, I-6.

for this is that there is no doctrinal requirement for Army aviation to be under the direction of a certified terminal air controller when employed in a CAS mission.<sup>189</sup> The helicopter usually talks directly to the ground unit commander or fire support officer after it arrives at the contact point. For command and control, Army aviation units may, on a mission basis, be placed under OPCON of a ground maneuver brigade. Conversely, infantry and armor units may be placed under OPCON of an aviation battalion or brigade.<sup>190</sup> Army and Marine attack helicopters are generally not included in the JFACC air apportionment recommendation or decision, but can be made available as directed by the JFC and scheduled through the ATO process.<sup>191</sup>

Air interdiction and Army aviation employment doctrines contrasts greatly with that of fixed wing CAS. Neither Army nor joint doctrine considers CAS to be a potential “decisive component” of ground operations. Air interdiction, on the other hand, is classified as “a form of aerial maneuver, coequal to ground maneuver, in both the planning and execution stages of the joint campaign...AI can significantly affect the overall course of a campaign.”<sup>192</sup> When employing AI, a terminal controller is not normally needed. Conversely, fixed wing CAS assets are normally employed in groups of 2 to 4 aircraft against targets short of the FSCL while under the direction of a certified terminal air controller.<sup>193</sup> Unlike helicopters, Air Force fixed wing CAS aircraft are doctrinally not OPCON to the ground commander. They remain under the centralized command and control of a single air manager, usually the JFACC, even after having been apportioned to directly support the ground commander’s scheme of maneuver.

The joint doctrinal view of CAS employment can be summed up as missions by individual aircraft which are tasked to attack individual targets in order to augment ground forces organic supporting fires with flexible and responsive *fire support*.<sup>194</sup> This description of CAS,

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<sup>189</sup> Lieutenant Shawn Greene, “Using Attack Helicopters,” *CALL Newsletter* (Fort Leavenworth, KS: Center for Army Lessons Learned, March-April 1995), 1.

<sup>190</sup> Department of the Army, *FM 1-100 Army Aviation*, 2-1.

<sup>191</sup> Joint Chiefs of Staff, *JP 3-09.3 JTTP for Close Air Support*, III-6.

<sup>192</sup> Department of the Air Force, *AFDD 2-1.3 Counterland*, 23.

<sup>193</sup> Joint Chiefs of Staff, *JP 3-09.3 JTTP for Close Air Support*, I-6.

<sup>194</sup> *Ibid.*, I-3.

combined with its current definition, leads one to clearly conclude that everyone, except possibly the Marines, envisions CAS as a tactical mission to augment ground forces fires. In other words, CAS is doctrinally viewed by the Army and Air Force as “flying artillery.” Only the Navy/Marine Corps view CAS as having the potential to be employed as an operational fires asset. Apparently, only massed helicopter attacks under the control of the Army and fixed wing air attacks which are beyond the FSCL and under the control of the Air Force, have the potential to be decisive to a campaign or major operation.

Why then all the confusion and argument over OPCON versus TACON control of CAS assets, the placement of the FSCL, and the use of CAS as flying artillery? Are these arguments due to a disconnect between the current doctrine and how services are actually employing CAS? Given this confusion, does our current doctrine facilitate the effective use of CAS?

The Army published its first post-cold war doctrine with its 1993 version of FM 100-5, *Operations*. With the collapse of the Soviet Union, the new manual stressed full-dimension operations from large scale conventional war to peacekeeping. The idea that tactical, as well as operational commanders, conduct offensive operations simultaneously throughout the depth of the battlefield was retained from AirLand Battle.<sup>195</sup> Therefore, success at the close battle was linked to the success of the deep and rear battles. The deep battle was especially important because it “nullified the enemy’s firepower, disrupted his C2, destroyed his supplies, and broke his morale...attacking enemy formations in depth delays, diverts, or reduces enemy combat capabilities and enables friendly forces to choose the time, place, and method to fight the close battle.”<sup>196</sup> Additionally, during the entry stage of force-projection operations, joint forces would likely be required to provide significant air support to Army forces until sufficient ground combat power had arrived in theater. CAS was expected to support land combat by attacking hostile targets *close* to friendly ground forces in all phases of the operation.<sup>197</sup>

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<sup>195</sup> Department of the Army, *FM 100-5 Operations*, 7-12.

<sup>196</sup> *Ibid.*, 6-14.

<sup>197</sup> *Ibid.*, 2-19.

In June 2001, the Army published its new operational manual, FM 3.0. This manual presents the doctrinal concept of a battlefield organized with simultaneous or sequential decisive, shaping, and sustaining operations. Decisive operations are those that conclusively determine the outcome of major operations, battles, and engagements.<sup>198</sup> Shaping operations are used to create or preserve opportunities for the success of the decisive operation. These operations affect enemy capabilities, forces, and decisions. FM 3.0 acknowledges that the linear deep, close, and rear battlefield of FM 100-5 may still be relevant in some battles today. Even so, it attempts to account for the conduct of non-linear battles with non-contiguous units where the concept of the operations, instead of shared boundaries, links the elements of the joint force.<sup>199</sup> FM 3.0 stresses the inherent ‘joint’ nature of land operations and advocates that the strength of each service component should be combined to overcome the limitations or to reinforce the effects of the other components. The “synergy” of multiple and diverse joint capabilities creates combat power more potent than the sum of its parts.<sup>200</sup> The bottom line view of FM 3.0 on airpower is that the ground and air campaigns are inherently linked. The goal of modern warfare design and conduct should be the integration, not segregation, of service capabilities.

FM 3.0 does not give a more detailed explanation of the role of CAS than the one presented in the previous paragraph. However, FM 3.0 does imply that CAS be used to shape the battlefield for the success of the decisive ground battle or campaign. Army manuals that discuss the role of CAS in more detail were written in the 1980s under the AirLand Battle doctrine. Therefore, to gain a better understanding of how the Army is currently using CAS, we must look to the Army’s Battle Staff Training Program (BCTP) and actual unit employment of CAS during rotations to the National Training Center (NTC) and the Joint Readiness Training Center (JRTC).

The Army’s Battle Command Training Program (BCTP) provides “a rigorous training environment that enhances the warfighting skills of our commanders” and “reinforce our ‘train as

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<sup>198</sup> Department of the Army, *FM 3.0 Operations*, 4-23.

<sup>199</sup> Department of the Army, *FM 3.0 Operations*, 4-20.

<sup>200</sup> *Ibid.*, 2-6.

you fight’ philosophy.”<sup>201</sup> The focus of the BCTP is on corps and division commanders and their staffs. BCTP trends briefings indicate that CAS is often sub-distributed to subordinate divisions and brigades instead of massed to exploit opportunities or protect friendly forces.<sup>202</sup> The result is that CAS is usually not incorporated or synchronized into the ground scheme of maneuver. It becomes a reactive asset instead of a proactive one. This occurs despite the fact that BCTP seminars prior to warfighter exercises stress the importance of massing the effects of air at the decisive point as well as ‘shaping’ the battlefield (normally beyond ground forces tube artillery ranges) to facilitate the decisive operation.<sup>203</sup> The BCTP staff and senior mentors teach that fixed wing CAS assets should *normally* be retained at corps level as much as possible for shaping the battlefield. Army helicopters though, with their long loiter times, flexibility, proximity to the FLOT, and vulnerability to short range air defense weapons, should be tasked to directly support the close battle. Deep attacks by Army aviation should only be undertaken at night, in low ADA threat environments, or against high payoff targets that other joint assets, such as fixed wing airpower, are not able to attack. What the “Army’s doctrine experts” seem to advocate is that fixed wing CAS should be massed whenever possible (not penny-packeted) and be integrated into the ground scheme of maneuver by attacking targets (shape the battlefield) that are outside of the range of the preponderance of ground weapon systems. Thus, fixed wing CAS is the ground commander’s primary asset to influence those enemy forces and assets that may have a *near-term* effect on the ground scheme of maneuver. This employment of CAS more closely relates to the concept of Battlefield Air Interdiction than the current joint definition and view of CAS.

With the BCTP instruction and doctrinal emphasis on simultaneous attacks throughout the depth of the battlefield, Army corps and divisions created Deep Operations Coordination Cells (DOCCs) to provide centralized control of deep operations.<sup>204</sup> These cells are staffed with the appropriate joint, multinational, and coalition force representatives to provide timely

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<sup>201</sup> BCTP Seminar briefing on *Warfighter Exercise Design* to SAMS Students, 8 Feb 2002, Slide 2.

<sup>202</sup> BCTP briefing on *Warfighter Trends for 1999 & 2001*, posted to BCTP web site, Slides 23-26.

<sup>203</sup> BCTP Seminar briefing to SAMS students on *Air Integration*, Feb 2002, Slide 35.

<sup>204</sup> Department of the Army, *FM 100-7 Decisive Force: Army in Theater Operations*, 7-6.



situational awareness, planning and coordination, targeting, and control of deep operations. The DOCC interfaces with the Joint Targeting Coordination Board (JCTB) and the corps targeting cell to provide a linkage between joint and organic fires. In the mid 1990s under the doctrine outlined in FM 100-5, this organization was primarily used to facilitate Army aviation deep attacks and ATACMS use beyond the FLOT. Since then, DOCCs have matured into a 24-hour-a-day system for prosecuting deep fires.<sup>205</sup> Today, DOCCs control and manage around-the-clock deep attacks against enemy maneuver and artillery units using a mix of artillery and Air Force assets when it is not feasible for Army helicopters to ‘go deep.’<sup>206</sup>

The use of CAS by Army brigades and battalions at the NTC and JRTC has been studied and analyzed in detail over the last six years. The USAF Air-Ground Operations School (AGOS), the Air-Land-Sea Application Center, the Army Research Institute (ARI), and the Army’s Center for Lessons Learned (CALL) have all investigated and developed lessons learned on CAS employment and use during these brigade exercises.<sup>207</sup> Additionally, in 1997 the Office of the Secretary of Defense chartered the Joint Close Air Support (JCAS) Joint Test and Evaluation (JT&E) organization to investigate, evaluate, and improve the operational effectiveness of joint U.S. close air support.<sup>208</sup> This organization has worked closely with each rotational unit at the NTC since 1998. The common finding of all these organizations was that

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<sup>205</sup> Major General William E. Ward, “Expanding the Role of the DOCC,” *CALL Newsletter 2-00* (Fort Leavenworth, KS: Center for Army Lessons Learned, 2000), 1.

<sup>206</sup> Ibid.

<sup>207</sup> For greater details on the results of these studies, refer to the following:

(1) In 1995, the AGOS collected trends, lessons learned, and observations on CAS from Observer/controllers at the NTC. The results of this study can be found at the Army Centers for Lessons Learned (CALL) web site under COL Edwin J. Den Beste, “CAS Integration Lessons,” *CALL CTC Quarterly Bulletin 95-1*. (Fort Leavenworth, KS: Center for Army Lessons Learned, 1995).

(2) The ALSB publishes quarterly lessons on Air-Land-Sea integration. CAS issues are often discussed. Reference for this paper was, “CAS Lessons Learned at the Combat Training Centers,” *Air Land Sea Application Center 94-1* (Langley AFB VA: Government Printing Office, 1994), 21.

(3) The Army Research Institute (ARI) conducted extensive research on CAS training and developed an *Integrated Task List for the Air-Ground Training Feedback System*. Their unclassified web site contains numerous monographs/ papers on CAS issues.

(4) The 549<sup>th</sup> Combat Training Squadron, Air Warrior, provides CAS to the NTC battlefield. During these exercise, they collect lessons learned. Reference for this paper was: “Training the Warrior Elite,” *Air Warrior 96-09 Final Report* (Langley AFB VA: Government Printing Office, 1996).

<sup>208</sup> JCAS JT&E, “JCAS Interim Report,” *Briefing to JCAS Symposium*, Quantico, VA, Oct 2000.

CAS is rarely integrated into the ground scheme of maneuver. Instead, CAS is an afterthought that is not synchronized nor rehearsed in the brigade's plan. Fifty percent of the time during the JCAS study, CAS was either diverted to alternate, deeper targets or exited the brigade area without engaging a target. For the majority of NTC rotations, the terminal air controller was not in position to observe the attack by the aircraft or was "killed" by the OPFOR prior to directing a strike.<sup>209</sup> The *Urban Warrior 97* exercise found similar results for urban combat situations in that CAS participants consistently failed to perform positive combat identification and were often killed by the OPFOR as they tried to move to a position to obtain visual identification of the target.<sup>210</sup> As a result, for both exercises, some type of reasonable assurance or non-doctrinal method of terminal control was utilized instead of the doctrinal recommended positive direct/indirect methods. When CAS was needed, the average request took twenty-five minutes from terminal controller check-in to bombs on target. The end result of all these issues was that only thirty-one percent of CAS sorties had the desired ground commanders effect on the battlefield.<sup>211</sup> Inadequate CAS techniques and procedures, limited battalion and brigade staff training on CAS use and employment, lack of coordination between the FSE and TACP, and TACP equipment deficiencies were cited as the primary contributors to this result.<sup>212</sup>

What these studies on brigade and battalion utilization of CAS indicate is that while ground commanders attempted to augment their firepower in the close fight at the decisive time and place with CAS, the majority of the time CAS was pushed deeper where it was not "too close" or too difficult to coordinate.<sup>213</sup> The decisive time and place was often not when and where it was originally envisioned. Therefore, the rapidly changing ground situation made it difficult for the FSE and TACP to utilize the aircraft during their limited "CAS windows." In this fluid

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<sup>209</sup> COL Gary Buis, "Air Warrior / National Training Center: Now versus Yesterday," *Air-Land-Sea Bulletin* 96-3 (Langley AFB VA: Government Printing Office, 1996), 7.

<sup>210</sup> United States Marine Corps, *MAWTS-1 Aviation Combat Element (ACE) MOUT Manual*, ed. IX (MAWTS-1, MCAS Yuma, AZ: 1 Sept 00), 5-44.

<sup>211</sup> JCAS JT&E, *JCAS Interim Report Briefing*, Slide 19.

<sup>212</sup> *Ibid.*, Slide 42.

<sup>213</sup> Air Warrior, "Training the Warrior Elite," *Air Warrior 96-09 Final Report* (Langley AFB VA: Government Printing Office, 1996), 22.

situation, the FSE and TACP also had difficulty providing timely targeting information to the CAS aircraft that were available.<sup>214</sup> As is the case in most combat situations, the enemy can have a significant influence on where and when the decisive time and place occurs if his actions are not effectively 'shaped' prior to the close fight. These issues once again demonstrated that flexibility and responsiveness is critical capability for CAS aircraft, their command and control systems, and their employment doctrine.

Today in Afghanistan, CAS is being used extensively to support the operations of U.S. and coalition conventional and Special Forces units. Unfortunately, there is not yet enough releasable information to make a detailed analysis of this campaign possible. Three general observations though, can be made. First, there is no FSCL in Afghanistan. All air-to-surface strikes required some type of coordination with the troops on the ground. Units are operating in non-linear and non-contiguous areas of operations with the majority of airstrikes under the control of a trained terminal air controller. During certain phases of the operation, coalition infantry and mechanized units were conducting linear battles from Mazar-e Sharif toward Kabul, while U.S. Special Operations Forces (SOF) were simultaneously facilitating airpower destruction of enemy forces and equipment throughout the AO (to include behind the main Northern Alliance FLOT). In conjunction with these operations, the Marines established a forward operating base south of Kandahar. From there, they conducted air and ground attacks against Taliban forces in the southern portions of Afghanistan. Second, due to the close proximity of troops and desire to limit civilian casualties, precision engagement with GPS guided munitions employed from a variety of aircraft (to include B-52 bombers) is the primary means of providing CAS. Third, unlike in the Korean War, Desert Storm, NTC rotations, and BCTP exercises, the majority of CAS missions in Afghanistan are being employed in close proximity to troops. The

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<sup>214</sup> JCAS JT&E, *JCAS Interim Report Briefing*, Slide 19.

limited organic firepower available to ground troops, the restrictive terrain, and the altitude at which ground battles are occurring has resulted in the majority of the CAS sorties being employed as aerial fire support. This extensive use of CAS demonstrates once again that in open, flat terrain where ground forces can bring all their combat capabilities to bear, CAS is often not needed. However, when this is not the case, such as in the jungles of Vietnam or in the mountains of Afghanistan, the flexibility, versatility, and firepower of fixed/rotary wing CAS is essential for the success of the close fight. Hopefully, the doctrinal community is taking a close look at how operations and CAS are being conducted in Afghanistan. Doctrine writers should keep in mind though that history has shown only two things to be for certain; this war was not like the last one (Desert Storm), and the next one will not be like this one.

## **Current Doctrine Summary**

There is a doctrinal disconnect today between what the services are saying, doing, and writing. This disconnect has led to much of the confusion between the definition, control, and role of CAS on the battlefield. Current written Army, Air Force, and joint doctrine contain a limited, tactical view of the employment of CAS. This view has directly contributed to the ineffective use of CAS by Army units and its delegation to the status of ‘flying artillery.’ Joint and service doctrine place more emphasis on the deconfliction and segregation (by the FSCL or other lines in the sand) of airpower than on the synergy of service capabilities. As discovered by the JCAS organization, the *integration* of personnel, training, and doctrine is the key to successful CAS employment.

Over the last ten years, the Army’s ability to conduct and command and control deep operations has greatly improved. As a result, the Army has pushed the FSCL further and further away from the FLOT. CAS has become key to the success of the close fight by shaping those enemy forces/capabilities that may have a ‘near-term’ impact on the ground scheme of maneuver. Army doctrine and training events increasingly employ CAS as an ‘operational fires’ assets with

tasks similar to those of Army attack aviation brigades and battalions. The elimination of the concept of BAI from doctrine did not change the need or desire of the ground commander to directly influence the battle beyond the reach of his organic weapons systems. Instead, we now have only one word (CAS) to describe air missions in close proximity to troops, air missions that require detailed integration to shape near-term enemy forces, and air missions that attack into 'Kill Boxes' with only limited coordination with ground forces. Consequently, the current joint definition of CAS does not reflect the concepts of AirLand Battle nor the Army's new operational doctrine, FM 3.0. With the Army and Air Force actually conducting CAS differently than what they are teaching and writing, it is a wonder that we are all not more confused. The establishment of the JCAS JT&E and the conduct of annual JCAS symposiums provides hope that these issue will be worked out before CAS is needed again.

## **The Future of CAS Doctrine**

What is the vision of CAS in 2015? To answer this question we have to look to articles published by service school faculty and students, individual component doctrine centers, and concept studies and papers conducted by paid 'think tanks.'<sup>215</sup> These documents all have slightly different view of how CAS will be conducted and with what types of aircraft and technologies. What they all agree on is that CAS, in some form or another, will be needed for the foreseeable future.

In 1995, Air Force Chief of Staff, General Ronald Fogleman, directed the Air University to examine the concepts, capabilities, and technologies the United States will require to remain the dominant air and space force in the future.<sup>216</sup> *Air Force 2025* is a collection of white papers that address this directive. The first sentence of the white paper, *Close Air Support in 2025*,

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<sup>215</sup> Key agencies for future warfare included the Air War College, the Army War College, RAND, CAC Fort Monroe, and Army After Next (AAN) studies and reports.

<sup>216</sup> Ronald O. Unterreiner, *Close Air Support (CAS) in 2025: Computer, Lead's in Hot* (Maxwell Air Force Base, AL: Air War College, 1996), 1.

proclaims “The mission of close air support currently exist in every service doctrine and will continue to be required in 2025.”<sup>217</sup> The study acknowledges that improvements in ground based firepower may reduce the need for support in the close battle, but that there will always be a need for airpower to have the *flexibly* to influence the ground battle directly or indirectly.<sup>218</sup> The ability to take advantage of unforeseen opportunities or respond to “bad luck” must be accounted for in future doctrine, training, organizations, and equipment.<sup>219</sup> This paper predicts by 2025 that precision weapons will make every air asset that can drop precision munitions capable of performing CAS. As we have seen in the recent Afghan campaign, this prediction is has been realized in 2002. B-52s, F15Es, A-10s, F-16s, F-14s, AV-8Bs, FA-18s, Helicopters and UAVs have all conducted some type of close support in Afghanistan. This standoff precision strike capability coupled with digitization of CAS request and improvements in situational awareness, is expected to greatly simplify weapon delivery tactics and defensive system requirements. Ground units operating on an “amorphous and opportunistic” battlefield, will diminish the importance of linear forward line of troops and fire support coordination line measures.<sup>220</sup> The battlefield will be one with no front, rear, or flank where detection results in engagement. The relative proximity of troops to the target may be the only discriminator between a CAS, AI, or even strategic attack mission.

USAF 2025 expects that unmanned air platforms will comprise the majority of delivery vehicles for CAS.<sup>221</sup> These unmanned platforms will be controlled by a manned aircraft or a ground TACP. Ground forces will simultaneously be operating their own UAVs to direct the fires of their artillery and long-range precision munitions. Munitions improvements will allow them to be reconfigured for hard or soft target attacks while on the platform. Improved combat identification and common situational awareness systems will be standard on all aircraft and

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<sup>217</sup> Ibid., vi.

<sup>218</sup> Ibid.

<sup>219</sup> Ibid., 1.

<sup>220</sup> Ibid., 17.

<sup>221</sup> Ibid., 2.

ground forces. Due to the fact that almost every airframe will be able deliver precision ordnance in close proximity to troops, the number of aircraft that could potentially provide CAS is increased dramatically. This capability will enable the JFACC to be more responsive and “push-CAS” to the ground commander when he needs it instead of preplanned “CAS windows.” For example, an aircraft on an interdiction mission or bomber on a strategic attack may be dynamically tasked to deliver some of its ordnance in direct support of ground forces and then continue on to its primary target.<sup>222</sup>

As both friendly and enemy forces fight from more dispersed battlefield in smaller more mobile formations, the ability of a ground observe to control CAS will decrease. Therefore, we will see an increase in both manned and unmanned aerial observers (helicopters, fixed wing, and UAVs ). The potential of an unmanned FAC platform is already evident today. The Combat Air Command’s UAV Battlelab is currently conducting extensive experimentation on the use of a FAC(U) to provide the “eyes” for terminal guidance of CAS missions, mark targets for attack by other platforms, and/or attack high payoff targets immediately.<sup>223</sup> The ultimate goal is for air strikes to only be under the direction of a terminal controller when the situation or commander directs that troops are “danger close” to potential weapons effects. Then, the aircraft will be required to follow a version of the current CAS employment doctrine and procedures. The use of these complex and difficult procedures will be the exception though, and not the rule in future CAS missions. In these situations, the connectivity of CAS platforms to ground forces and a shared common situational awareness will be key to the successful employment. All of these airframes and precision air and ground munitions engaging multiple targets simultaneously throughout the depth of the battlefield imply that airspace management and control will be a central issue of future CAS missions.

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<sup>222</sup> Ibid., 7.

<sup>223</sup> Air Combat Command, “Concept of Operations for Loitering Armed Reconnaissance and Forward Air Control UAV—FAC(U),” *UAV Battlelab*, from briefing slides to CAF Weapons and Tactics Conference Dec 2000, Slide 42.

The Army doctrine community has yet to publish a concept paper on its vision of CAS in 2015 or later. Some Army doctrine developers have expressed their view that CAS in 2015 will be conducted just as it is today.<sup>224</sup> They expect improvements in digitization of the nine line brief and situational awareness of ground forces locations (due to the fielding of FBCB2 and SADL), but very little change in the use and command and control of CAS sorties.<sup>225</sup> Unfortunately, the last sixty years of relatively stable CAS doctrine, command and control, and employment methods lends support to their arguments.

The Army expects that Units of Action will utilize organic standoff capabilities as much as possible to defeat enemy forces in their Red Zone battles. As these battles become prolonged and/or air and ground lines of communications are disrupted, the ability of Units of Action to sustain their battlefield tempo and suppressive/destructive fires will be limited. In these cases, fixed, rotary wing and unmanned CAS aircraft will likely be the ground commander's primary asset to augment the destructive fires of Objective Force Units of Action. Additionally, because Objective Forces are more mobile, their vehicles will be lighter and more vulnerable to direct fires. This means that a higher value will be placed on CAS (than in current Army doctrine) to set the conditions (shape) in potential Red Zones for the introduction of Units of Actions and prevent disruption of their operations by enemy forces in the "white spaces."<sup>226</sup>

With an increased emphasis on CAS in Objective Force operations, the Army will continue to advocate the involvement of the Air Force in the close air support mission.<sup>227</sup> Although attack helicopters and UAVs can be employed in the CAS role, only fixed wing aircraft

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<sup>224</sup> Un-named Lieutenant Colonel in Army After Next Project Office, interview with author on *The Army's View of the Future of CAS*, phone conversation, January 1999.

<sup>225</sup> SADL is Situational Awareness Data Link. It is an airborne version of EPLRS radio that integrates with Army Tactical Internet. Provides digital means for CAS control and real-time mission monitoring. EPLRS used to report position of friendly vehicles to fighter aircraft digitally.

FBCB2 is Force XXI Battle Command Brigade and Below. It is the tactical computer system that provides a common operational picture to all vehicles of friendly and enemy forces.

<sup>226</sup> White Space is non-doctrinal term to refer to the "open" areas between non-contiguous units that is controlled by a higher headquarters or other designated organization.

<sup>227</sup> Vector Research, "The 21<sup>st</sup> Century Army: Report of the Roles, Missions, and Functions of the Army in an Age of Information and Uncertainty," *Research Report for the Office of the Army Deputy Chief of Staff for Operations and Plans*, contract number MDA903-91-D-0029 (Ann Arbor, MI: Vector Research, 1995), 20.



have the speed and range to cover the entire Objective Force battlefield.<sup>228</sup> If forward refueling and rearming points cannot be established, Army helicopters (which lack in-flight refueling capabilities) may not be able to provide continuous CAS to widely separated Objective Force Red Zone fights. Army helicopters are also much more vulnerable to enemy ADA and direct fire systems than are high altitude fixed wing aircraft. Army After Next wargames in 1999 suggest that aircraft survivability is as great an issue during Objective Force operations as protection of the ground forces.<sup>229</sup> Only by the Air Force retaining CAS as a primary function, will the liaison and control structure needed to carry out effective fixed wing close support for Objective Force operations be retained.<sup>230</sup>

The Army's Comanche helicopter is expected to alleviate some of the disadvantages mentioned above. The Comanche is designed to be a stealthy, long-range precision fire weapon system for the Objective Force. It will be equipped with sufficient command and control and situational awareness systems to serve as the integrator for joint fires. With an average combat radius of 300+ kilometers, the Comanche will have greater loiter times near Units of Action Red Zone battles than the current AH-64 attack helicopter (200+ Kilometers radius combat loaded). Unfortunately, to remain stealthy, it must internally carry its weapons. This greatly limits its munitions load and ability to engage multiple targets. Its lack of an in-flight refuel capability and vulnerability to ground fires may also prevent it from effectively conducting CAS in certain enemy situations and/or terrain (such as high altitude fights in Afghanistan). Therefore, fixed wing airpower will still be needed to augment and complement the Comanche's capabilities.

The realizations of the future visions of CAS presented in this chapter are dependent on the continued close cooperation between the services and an agreement on what the future vision really is. Currently, each service has its own ideas about what the future battlefield will look like and how it will be commanded and controlled. Unfortunately, disconnected service visions

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<sup>228</sup> Estimated combat loaded radius of Comanche is 300+ km.

<sup>229</sup> RAND Corporation, "The Future of Warfare: Issues from the 1999 Army After Next Study Cycle," *RAND Corporation Research Project for the Department of the Army* (Washington D.C.: RAND Corporation, 2000), 56.

<sup>230</sup> Vector Research, "21<sup>st</sup> Century Army," 20.

utilizing the same joint asset has resulted in the confusion and disagreements on the control and use of CAS that we see today. Similar disconnects can only be avoided in the future by the services having a unifying CAS document. Joint Publication 3-09.3 is primarily a current “how to” manual on CAS. It does not provide a unifying concept or framework for the use and control of CAS in the future. The publishing of JCAS 2020 or a similar document would provide the unifying vision necessary to assist in the development of Joint CAS doctrine, organization, and equipment for 2015 and beyond. The JCAS Capstone Requirements Document currently under development by the Marine Corps is this first step.<sup>231</sup> Whether or not we take the next steps will determine the real future of CAS in 2015.

### **Implications for the Objective Force**

Current joint doctrine is not adequate/suitable to facilitate CAS in support of Objective Force operations. The current CAS definition, employment doctrine, and command and control structures are disconnected from how CAS is being used and taught. The current definition stresses the tactical use of CAS in the close fight. Yet, ground commanders increasingly rely on CAS to shape near-term forces instead of augmenting their organic fires to disrupt or destroy enemy forces that are in close proximity to ground units. This primary role of CAS as another maneuver element to be employed by the ground commander with maneuver and operational fires type tasks is not recognized. Instead, Army, Air Force, and Joint doctrine concentrates on how to deconflict CAS versus integrate it into the ground scheme of maneuver. For effective use of CAS in Objective Force operations, the services can no longer divide up the battlespace and say “I can only do CAS or deep strike.”<sup>232</sup>

Current non-linear and non-contiguous operations in Afghanistan demonstrate once again that CAS doctrine, equipment, and control mechanisms must be flexible enough to support both

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<sup>231</sup> JCAS Executive Steering Committee, *Coordination Briefing to the JROC*, 14 Jan 2002, Slide 5.

<sup>232</sup> Keithly, “Revamping CAS,” 16.

“deep” shaping and “close” aerial fire support CAS missions. However, today’s joint airpower doctrine is designed for a fight on a linear battlefield against another heavily industrialized nation. This is despite the fact that the US has enjoyed air superiority in every battle since 1944 and the primary industrialized threat, the Soviet Union, no longer exist. The battles of 2015 are expected to be against “regional hegemons” possessing limited industrial capacity but employing off-the-shelf precision weapons technologies and asymmetrical web-like defensive patterns from complex and urban terrain in order to neutralize U.S. firepower advantages. A joint doctrine that supports the Objective Force concept of fighting simultaneous ground and air battles throughout the depth of the battlespace against such an enemy must be developed and accepted by all services or these disconnects will continue.

The future visions of Joint CAS capabilities and control in 2015 should please everyone. Unfortunately, as we have learned from history, visions are not always realized as soon as we would like. Today, if directed by the Joint Force Commander, all fixed and rotary wing aircraft can come under the centralized control of a single air manager (JFACC). In reality though, Air Force aircraft, Army helicopters, and Marine airpower normally remain under the control of their respective services. As demonstrated in Korea, Vietnam, and Desert Storm, the Army and Marines vehemently object if their “organic” systems are taken away from them. They do not trust the single air manager system to be responsive to fluid and uncertain ground combat situations. Ground commanders question whether the single air manager will approve his CAS target nomination for attack or, as the JFACC sits in the JFC headquarters and sees the “big picture,” divert the sorties elsewhere. Therefore, it is unlikely that all aircraft capable of delivering precision munitions will be able to be dynamically tasked for CAS or AI missions in 2015. Instead, as both the Army and Marines have indicated in previous studies, doctrine, and experience, each service will retain some air-to-ground capability under their direct control.

For Objective Force operations in 2015, all air platforms may in fact be able to deliver precision munitions in support of shaping tasks, but only a few, specific platforms or squadrons/units will have the training to deliver these munitions under troops-in-contract situations. Recent fratricide events in Afghanistan provide insights as to the results when any airframe /crew conduct CAS. Mistakes by the terminal controller are less likely to be “caught” by a pilot who has little to no experience or training in CAS versus one who does.<sup>233</sup> Additionally, the positive control and reasonable assurance procedures outlined in JP 3-09.3 require a well trained terminal controller. As the battlefield expands and the distance between units increases, the doctrine of having an Air Force ground TAC observe and direct air strikes will increasingly become infeasible. The jungles and non-contiguous battles of Vietnam, the distances between supporting strikes and ground forces (5km) in Desert Storm, and brigade and battalion operations at the NTC, all support this trend. To offset this problem, more reliance will be placed on airborne controllers who can gain ‘virtual assurance’ from ground digital situational awareness and combat identification systems. These airborne controllers will consist of Army and Air Force personnel operating from both manned and remotely piloted platforms. The myth that only pilots can properly control and integrate airpower for CAS missions was broken as early as the Korean War with the successful use of Army TACPs and in the 1980s with the creation Air Force of ETACs. Army ground and airborne joint firepower integrators will be required to control CAS missions when Air Force personnel are not available. These “joint effects” officers or enlisted soldiers should be fully integrated into the ground commander’s staff and effects coordination cells, thereby maximizing his knowledge of the ground scheme of maneuver and minimizing the key issue of integration raised by the JCAS and other recent studies.

Several current Air Force doctrine developers believe that “there will always be a need for some type of FSCL.”<sup>234</sup> Yet, Army Objective Force concepts resemble the non-linear

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<sup>233</sup> MAJ Scott Grey (A-10 Pilot), interview by author, tape recording, Fort Leavenworth KS, 28 Feb 2002.

<sup>234</sup> COL Phillip Frazee, Director of USAF Doctrine Center, interview with author, tape recording, Fort Leavenworth KS, 13 March 2002.

battlefields of Vietnam and Afghanistan more than Desert Storm. On those battlefields, there was no FSCL. Instead, detailed coordination and integration of airpower into the ground scheme of maneuver was the preferred method of airpower employment. Will this be true in 2015 non-linear battles as well? With improvements in combat identification and situational awareness technology, pilots should have as good an idea where friendly forces are as the ground commander. Unfortunately, deconfliction of the airspace in battalion Red Zones will still present significant challenges. One can only postulate then that a FSCL or similar fire control measure will surround these Red Zone bubbles (three dimensional AO) to facilitate rapid engagements in the white space by the JFACC.<sup>235</sup> Technology will insure that the FSCL is a permissive, not restrictive, control measure. Improved combat identification and vehicle/aircraft tracking systems will allow simultaneous engagement by air and ground forces forward of the FSCL without risk of ground to air fratricide. This level of situational awareness will allow rapid shifting of the FSCL and other control measures throughout the battlespace.

The new version of JP 3-09.3 is scheduled for release in January 2003.<sup>236</sup> This is eight years after the last revision. Army FM 3.0, *Operations*, was released eight years after the last edition of FM 100-5. The current Army fire support manual for divisions and corps, FM 6-20, was last revised in 1989. Its replacement, FM 3-09, is scheduled for release sometime in the next year.<sup>237</sup> Bottom line is that on average, it takes between eight to twelve years for new doctrine to be published. This means that after the January 2003 release of JP 3-09.3, the next revision will probably not be available until around 2013. Therefore, the joint CAS doctrine being written and published within the next year will be how CAS is thought about, controlled and employed during the next ten years. Fortunately, given this timeline, it is feasible that new joint doctrine, which encompasses Objective Force concepts, will be written prior to 2015. Unfortunately, if the joint

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<sup>235</sup> A potential control measure may be a modification of the "Kill Box" system. During allied operations in Kosovo, Kill Boxes were established throughout the AO and could be quickly turned on and off as engagement areas.

<sup>236</sup> Joint Chiefs of Staff, *Coordination Briefing to the JROC*, JCAS Executive Steering Committee, 14 Jan 2002, Slide 9

<sup>237</sup> Combined Arms Center, *Combined Arms Doctrine Directorate Library*, online source, accessed 20 Feb 2002; available from <http://www-cgsc.army.mil/cdd/ADMIN/doc-lib.htm>; Internet.

force waits until 2013 publish this new doctrine, the equipment and training necessary to implement it may not be available until several years later.

Future CAS concepts and white papers provide hope that technological solutions will alleviate current friction between the services on CAS use and control. However, based on the historical evidence and current views of CAS, it is unlikely that a revised doctrine which emphasizes more airpower sorties in a direct support role of ground combat or as the decisive component of Objective Force operations, will be acceptable to the Army or Air Force. Without significant efforts by both the Army and Air Force, future CAS doctrine seems doomed to continue its emphasis on deconfliction and separation of ground and air capabilities with each service retaining control of its own organic assets. This means that the doctrinal disconnects between the services on the use and control of airpower in support of ground operations is likely to be present on the Objective Force battlefield in 2015.

## V. CONCLUSIONS

*Unquestionably, to attack with the bayonet and hand grenade is a highly inefficient way to kill the enemy, even more so than by air attack, yet we must resort to it and must rely on it. Therefore, though close support aviation is a poor appendage of strategic air power, it is an essential extension of ground action. When that salient fact is recognized and accepted by both sides, we will progress in the matter of real air support of ground action. The Air Force rejects the role of ground support and the Army should demand it.*

—Maj Gen Edward M. Almond  
Letter to US Army Chief of Staff, January 1951

The history, current doctrine, and future concepts for close air support indicate that CAS will not be where needed, when, and in sufficient quantity to support Objective Force operations during its *initial* engagements and battles in 2015. This is because the current doctrine and CAS definitions are not suitable for effective Objective Force operations. On the battlefield of 2015, integration, not segregation is needed at the operational and tactical levels of war.<sup>238</sup> Yet, the current doctrine and history on the use and control of airpower in support of ground operations suggests a focus on segregation and deconfliction. Doctrinal “lines in the sand” are often drawn between Army and Air Force operations to separate the so called deep and close battles. The implication is that the Army only conducts close battles and the Air Force deep ones. As a co-equal service, the Air Force has its own air campaign objectives to accomplish in the ‘deep battle.’ Therefore, as stated in their current doctrine, they desire to participate in the close fight only in emergencies or when the mission has been preplanned several hours /days in advance.<sup>239</sup>

Unfortunately, no one really knows where the close battle ends and where the deep battle begins. Some authors have advocated that “deep” begins where the preponderance of ground weapon systems effects end.<sup>240</sup> Apparently, the enemy forces outside of this 40+ kilometer area should not be of concern to the battalion, brigade, division or even corps commanders until these

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<sup>238</sup> Gonzales, *Tactical Air Support of Ground Forces in the Future*, 18.

<sup>239</sup> Department of the Air Force, *AFDD 2-1.3 Counterland*, 40.

<sup>240</sup> Warden, *The Air Campaign: Planning for Combat*, 87.

forces close within range of their weapon systems. The Army's Airland Battle doctrine and its current manual on operations, FM 3.0, rejects this thought process. In Airland Battle, the fixed wing air assets distributed to Army corps and divisions for close air support missions were augmented with Battlefield Air Interdiction sorties to shape the battlefield outside of the range of Army organic weapon systems. Today, CAS is used to both augment the ground commander's organic fires in close proximity to troops as well as shape near-term enemy forces beyond the ranges of the preponderance of ground fires.

The current joint definition of CAS has not caught up with the concepts contained in FM 3.0 or even the "linked" close, deep, and rear battlefield ideas of FM 3.0's predecessor, FM 100-5 (which was last published in 1993). CAS is no longer just "flying artillery" accomplishing limited tactical effects in individual engagements. Increasingly, it is being used as a separate maneuver element to shape the battlefield for the success of ground battles and major operations. This operational potential of CAS is currently only recognized by the Marine Corps. One reason for this is that the current definition of CAS is based on the concepts, doctrine, and technology of over fifty years ago. This definition, which is anchored on the concepts of close proximity and detailed integration, confuses military practitioners as to how to employ CAS when the capabilities of both friendly and enemy ground forces to influence the battlespace has gone from less than twenty kilometers in World War II, to over two-hundred kilometers today. The confusion on what CAS is and how it should be used directly contributes to the lack of airpower integration that has been exhibited during BCTP exercises and brigade rotations to the NTC. The proposed update to JP 3-09.3 would keep this same definition until its next revision sometime around the year 2012. For CAS to be where and when it's needed on the battlefield of 2015, the services must agree on what CAS really is and who can command and control it.<sup>241</sup> Answering these two question will lead to effective doctrine on "how" CAS should be employed in support

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<sup>241</sup> Keithly, "Revamping Close Air Support," 15.



of Objective Force engagements, battles, and operations. Fortunately, with ten years being the average time needed to revise doctrine, it is still feasible to make the needed changes in joint doctrine before the Objective Force is fielded.

Changes to joint doctrine that result in a greater degree of control/influence by Objective Force Commanders on the use of fixed wing airpower in support of ground operations will not be acceptable to the Air Force. Concepts that increase the number of air sorties that directly support the Objective Force Commander's ground scheme of maneuver will be resisted as well. Even when airpower is employed in direct support of Objective Force ground operations, it is likely that the Air Force will continue to insist that only an airman can properly integrate and command and control fixed wing aircraft. This belief exist even though Marine Corps ground commanders commonly command and control Marine Air Wings and Army ground commanders control and employ rotary wing aviation brigades and battalions. Conversely, Marine and Army aviators are allowed to directly command and control ground troops. Clearly, this level of integration and trust between the Army and Air Force does not yet exist.

To the Air Force, "Centralized command of airpower is a fundamental tenet of aerospace power and must be followed to guarantee the concentration of aerospace power where it is needed most."<sup>242</sup> Therefore, any efforts to "penny-packet" airpower away from a single air manager (JFACC) in direct support of individual Objective Force divisions, brigades, or battalions, will not be acceptable. Additionally, since the Air Force believes that Air Interdiction "can significantly affect the overall course of a campaign" while CAS has only "brief tactical effects," they will resist Army efforts or doctrine to obtain additional CAS sortie allocations from the JFC. The Air Force is likely to advocate doctrine/JFC policies that place restrictive fire control measures as close to ground units as possible. To the Air Force, this action expands the air commanders' battlespace, eases deconfliction and fratricide concerns, allows massing of airpower effects at decisive points, and facilitates rapid attack of targets of opportunity. Continued

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<sup>242</sup> Department of the Air Force, *AFDD 2-1.3 Counterland*, 10.

resistance to increasing airpower assets/sorties that support ground force objectives will result in the Objective Force commanders not having the quantity of CAS where and when they need it on the battlefield of 2015.

The two key factors when employing CAS have always been the need to provide flexible, real-time targeting guidance to CAS aircraft and the need to avoid hitting friendly ground forces in close proximity to the target.<sup>243</sup> The digitized command and control systems and joint interfaces of the Objective Force should minimize these concerns. However, due to the dispersed battlefield of 2015, many of the current doctrinal terminal guidance procedures and control methods for CAS will no longer be valid or viable. The current ground based TACP structure manned only by Air Force personnel will have limited effectiveness in the widely dispersed and simultaneous Unit of Action Red Zone battles. Instead, airborne controllers operating from Army helicopter, UAVs, and Air Force aircraft will fulfill much of the actual “control” role. Air Force ground based TACPs will still be needed for their liaison capabilities and expert knowledge on fixed wing aircraft to insure that airpower is being properly integrated into the ground scheme of maneuver. When airborne controllers or USAF TACPs are not available, Army “effects coordinators” in FSC battalions must have the training, equipment, and authority to provide terminal guidance for fixed and rotary wing aircraft operating in close proximity to troops.

The bottom line is that for effective joint operations in 2015 on a non-linear battlefield where there may not be a separation between close, deep, and rear areas, the integration and trust between the services must be greater than it is today. The goal for the joint force should be for Army commanders to be comfortable having ground/air combat units working directly for airmen and for the Air Force to trust ground commanders to effectively employ airpower that is OPCON to them for a specific period of time or mission. Only when ground commanders believe/trust

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<sup>243</sup> Department of the Air Force, *AFDD 2-1.3 Counterland*, 35.

that airpower will be where and when they need it, will they fully integrate CAS into their scheme of maneuver or make it the “decisive component” of an Objective Force operation.

How can we insure that the Objective Force will have the support of airpower where and when it needs it in the 2015 operational environment? First, CAS must be redefined. How CAS is defined should be based on its expected use/role in support of Objective Force operations. Will it be used strictly as an aerial fire support asset to augment the ground commander’s organic weapons in close proximity to troops, or will it also be used to shape near-term forces that may adversely affect Red Zone fights. The answer based on the historical analysis, current use, and future concepts, is both. Therefore, one definition must adequately encompass both the close proximity and near-term shaping capabilities of CAS, or new joint terminology that specifically address the use of airpower in direct support of ground operations and against near term forces must be created.

The Air Force Joint Firepower Control Course (JFCC) has recommended, “We make the doctrine and definition match what we actually do.”<sup>244</sup> As such, they advocate that close air support become a component of “Battlefield Air Support (BAS).”<sup>245</sup> BAS would encompass CAS as currently defined as well as the AirLand Battle concept of Battlefield Air Interdiction (BAI). When troops are in close proximity to weapons effects or engagements take place where detailed integration/deconfliction is necessary, the current CAS term and control measures would apply. When airpower is used to shape near-term enemy forces/capabilities and less restrictive control measures are needed, the term Battlefield Interdiction (BI) would apply. In effect, the old concept of BAI would be codified into joint doctrine.

Once the joint community accepts the terms Battlefield Air Support and Battlefield Interdiction, the definition of CAS will still need revision. With BI sorties shaping near-term

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<sup>244</sup> Air Combat Command, *Joint Firepower Control Course Brief*, CAF Weapons and Tactics Conference, 8 Dec 2000, slide 23, online source, accessed 20 Feb 2002; available from Air Combat Command Homepage (web address classified secret); SIPRNET.

<sup>245</sup> Ibid., slide 21.

forces, CAS would now be employed strictly as a tactical asset to augment Units of Action fires in Red Zone engagements. Therefore, a more appropriate definition of CAS under the BAS concept is “aerial firepower in direct support of the ground scheme of maneuver that requires detailed integration with the fire and movement of those forces due to the close proximity of friendly forces or their weapons effects.”<sup>246</sup> The use of the BAS concept in joint doctrine has the potential to decrease the confusion on how to employ and control airpower in support of ground operations and more closely aligns joint doctrine with current reality. The joint force should support this recommendation by the JFCC.

How airpower sorties would be allocated and distributed under this concept is not quite clear. Based on current doctrine and use however, the JFACC would most likely distribute BAS sorties to Objective Force Corps. The corps commander would then determine which of these sorties would be further sub-distributed to divisions for direct support of Red Zone engagements/battles and which will be used as BI missions to shape near term forces.<sup>247</sup> To facilitate this concept during Objective Force operations, the creation of additional control measures may be needed. One such measure that would prove beneficial is the Marine Corps Battlefield Coordination Line (BCL). This is a non-doctrinal fire support control measure sometimes used by the Marine Corps to distinguish close support sorties from shaping sorties that are short of the FSCL. The BCL is basically a dividing line that indicates where restrictive terminal guidance/control measures are needed for CAS missions versus CAS missions that require little or no terminal control beyond pre-planned integration into the ground commander’s scheme of maneuver. For Objective Force operations, the BCL would extend to the outer limits of Red Zone battle areas. Given the digital command and control systems and common operational picture, an aircrew and terminal controller could use this control measure to quickly determine

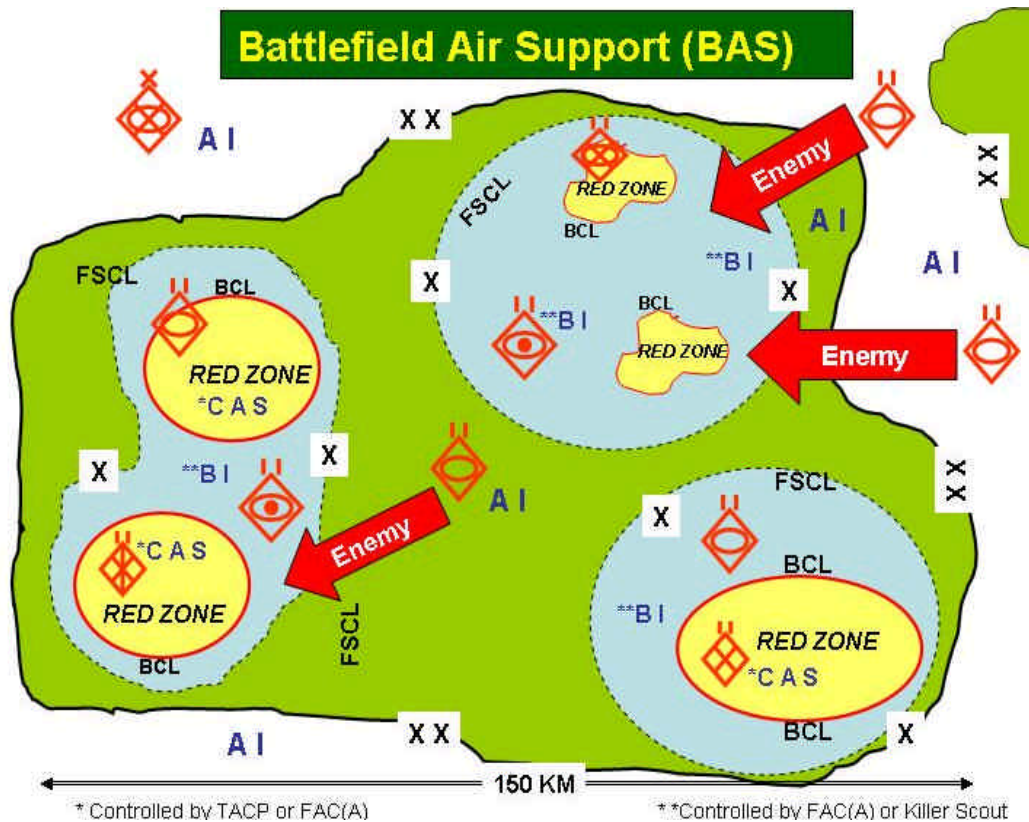
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<sup>246</sup> General Franks alluded to another potential tactical definition for CAS, “Aerial platforms attacking targets that are in the same battle space as ongoing direct fire engagements” in his interview with MAJ Carpenter.

<sup>247</sup> Historically, around 25% of ground-attack sorties apportioned to CAS. Approximately 30% of this amount was retained/distributed for XCAS. The remaining 70% was used for pre-planned shaping operations.

the degree of control required for a particular sortie. Aircrews that have been specially trained to deliver ordnance in close proximity to troops would be used to the maximum extent possible within Red Zones battle areas while all other types of aircraft/crews could be employed between the BCL and FSCL. Figure 5 provides an example battlefield construct utilizing the BAS concept.

FIGURE 5



If splitting the definition of CAS into two separate terms is not acceptable to the joint community, then at a minimum, CAS should be redefined so that the term "close proximity" is eliminated. As demonstrated, the majority of CAS missions in our historical analysis and in current exercises are used several kilometers beyond friendly forces to shape the battlefield. The employment of fixed wing CAS sorties in close proximity to friendly forces has proven to be the

exception. Therefore, a more appropriate definition of CAS that incorporates both the close support and shaping mission is, “Air action by fixed, rotary, or unmanned aircraft which is in direct support of the ground scheme of maneuver or requires detailed integration with the fire and movement of friendly ground forces.” Detailed integration (which includes some type of terminal control) would be required when there is a risk of ground-to-air fratricide from ground forces weapons effects or air-ground fratricide due to the proximity of ground forces to air delivered munitions.

Now that we have redefined CAS, there are three potential courses of action (COA) that stand out from the analysis which will improve the odds that CAS will be where needed, when, and in sufficient quantity to facilitate effective Objective Force operations. These COAs are not mutually exclusive and may be combined to form a new COA. Additionally, although each recommendation is feasible and suitable to improve CAS, it may not be acceptable to the Army or Air Force dependent on service doctrine, culture, or the financial and personnel cost of adopting the COA. Determining all of these factors is beyond the scope of this analysis, but some general conclusions on acceptability can be reached based on the historical and current doctrine analysis.

Course of action one does not recommend any drastic changes to current doctrine, organizations, or equipment. Due to this fact, it will be the most acceptable of the three recommendations to the Services. This COA is a recommendation to focus on marginal improvements in joint doctrine and training in the hope that these will have disproportional effects on CAS integration and employment in future operations. As indicated by the current JCAS organization and previous studies, CAS doctrine, equipment, and control systems are not “broken.” The integration of CAS with the ground scheme of maneuver and the training of personnel responsible for commanding and controlling CAS is where deficiencies are continually noted. Therefore, at a minimum, CAS must be redefined as previously discussed and training and integration of CAS with ground forces must be improved. One method to improve integration is

to habitually assign CAS squadrons to support specific Army divisions.<sup>248</sup> Habitual relationships often lead to more trust, confidence, and interaction between organizations.<sup>249</sup> Another recommendation to improve training and integration is that when the A-10 is retired, a specified number (TBD) of JSF and/or F-16 squadrons should be designated as primary CAS units. This action will insure that the training of these units are focused on the CAS mission. With the potential retirement of the only fixed wing aircraft designed for close support, the Army must increase its participation in the requirements determination for unmanned and fixed wing CAS aircraft capabilities. Currently, the Army sends one major three times a year to meetings on JSF CAS capabilities. Yet, the Army has assigned a Lieutenant Colonel for full-time liaison with the C-17 program office. This is an excellent indicator of Army priorities. At a minimum, the same priority should be given to determining the requirements for CAS doctrine and platforms. Since the Comanche helicopter is expected to be a primary joint integrator for Objective Force operations, a third recommendation is to emphasize Joint Air Attack Team (JAAT) training.<sup>250</sup> Today, JAATs are rarely conducted.<sup>251</sup> The synergistic effects of fixed wing air and helicopters working together against a single objective has proven to be a deadly combination to enemy forces.<sup>252</sup> Finally, besides improving their ability to work with fixed wing aircraft, helicopters should also increase their ability and training to conduct the CAS mission. Helicopters are increasingly being tasked for this important mission while fixed wing CAS sorties attack deep. This trend is likely to continue with Objective Force operations.

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<sup>248</sup> George Haywood, "When the Army's 82<sup>nd</sup> Airborne Needs Fire from the Sky, it Looks to the 14<sup>th</sup> ASOS to Call the Shots," *Airman*, vol. 43 (May 1999), 44. This organization works habitually with the 82<sup>nd</sup>. Habitual relationships were also established between certain Air Force units and Army Corps during both World War II, Korean and Vietnam conflicts. See Momyer, *Airpower in Three Wars*, 257.

<sup>249</sup> Brian W. Jones, "Close Air Support: A Doctrinal Disconnect," *Airpower Journal* (Winter 92, vol 6, issue 4), 66.

<sup>250</sup> JAAT is a coordinated attack by rotary and fixed wing aircraft, normally supported by artillery or naval surface fire support; Department of the Army, *FM 90-21 JAAT Multiservice Procedures form Joint Air Attack Team Operations* (Washington, D.C.: US Government Printing Office, 1998), I-1.

<sup>251</sup> COL Phillip Bracy, Director of USAF Doctrine Center, interview with author, tape recording, Fort Leavenworth KS, 13 March 2002.

<sup>252</sup> Gonzales, *Tactical Air Support of Ground Force in the Future*, 73; Test of JAAT in 1979 with A-10 and Cobra Atk helicopters and OH-58s....the combined forces achieved up to three times the numbers of hits for an approx 60% reduction of their own losses compared with missions conducted each on their own...Another example is the Israeli's in Lebanon in 1982 where the JAAT concept destroyed 30% of the Syrian tanks.

The primary recommendation in the second course of action is for the Army to take on the CAS mission within its organic artillery ranges. This proposal will be acceptable to the Air Force, but may not be to the Army. The Army has rejected three previous attempts by the Air Force to rid itself of the CAS mission. Yet, the Army attempted to procure and arm fixed wing CAS aircraft during the Korean and Vietnam conflicts. Failing to gain approval for this endeavor, the Army built a large fleet of armed attack helicopters which it has employed in the CAS role on numerous occasions. Because attack helicopters are organic assets of the ground commander, he is assured that they will be where and when he needs them. However, the expected ADA threat in the 2015 operational environment will make low flying helicopter operations extremely dangerous. To remain stealthy, the Comanche will have to keep its munitions stored internally, significantly reducing its engagement potential. Heavily armed UAVs that accompany and are controlled by Comanche would alleviate this shortcoming. An armed UAV would also have a greater loiter time in the objective area. When the Comanche is forced to depart the area, control of the UAV could be transferred to a ground station. Therefore, providing an armed UAV wing of three squadrons to an Objective Force Division should be considered.<sup>253</sup> This would insure that each echelon (UE and UA) had some type of organic aerial fire support capability. Finally, at a minimum, the Air Force must retain the capability to conduct emergency and near-term shaping CAS. This means that Air Force ALOs/TACPs would still be needed at brigade, division, and corps levels, but not necessarily with each UA battalion. Army personnel who are specially trained to employ and terminally control rotary and fixed wing CAS will fill this role for UA battalions and companies.

The third and final course of action will be the least acceptable to the Air Force, but has the potential to have the greatest positive impact on the integration and use of airpower in Objective Force operations. Some authors, such as Martin Van Creveld, believe that air assets should no longer be grouped into a separate service but increasingly revert back to sea and land

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<sup>253</sup> This argument is in line with General Arnold's comments and AWC study findings in Korea.



services.<sup>254</sup> This re-unification would simplify command and control and improve integration, but, based on history, this prospect is not likely. Therefore, a compromise would be to include a specific number of fixed wing ground attack squadrons with Objective Force corps and division Combined Arms Air-Ground Task Forces. The Objective Force Division Air-Ground Task Force (DAGTF) is being designed to be highly tailorable for specific missions or contingencies and support committed combined arms brigades and battalions with long-range fires/effects, ISR, and maneuver support capabilities as required by the tactical situation and assigned objective.<sup>255</sup> The DAGTF will possess inherent C3 and mission-tailored lift capability to conduct battalion-sized vertical maneuver operations, with the Objective Force Corps augmenting the operation with ISR, attack aviation, and long-range fire support as required. Under this concept, a DAGTF could be tasked organized with Comanche helicopters, vertical take-off and landing variants of the Joint Strike Fighter (owned by USAF squadrons who specialize in close support and ground attack operations), advance tactical rotor craft, and USAF C130 / C-17 aircraft for a specific period of time or for a specific mission as required by the situation. These specialized fixed wing squadrons and rotary wing battalions and brigades could be task organized under Ground Attack Wings (GAWs). These wings would be Air Force organizations that work habitually with specific Objective Force Corps and/or divisions (or OPCON for specific period depending on the situation). A GAW would be similar to Marine Corps Air Wing (MAW) in that fixed and rotary wing attack and transport assets are contained in its structure under the control of an airman or aviator. Both fixed and rotary wing sorties not needed by the corps commander for Battlefield Air Support missions would be diverted to interdiction tasks (similar to concept used by General Horner in Desert Storm). This concept would result in the centralization of all airpower assets under an airman, but then would doctrinally decentralize specific types of aircraft and units in direct support of Objective Force operations. The JTF commander would retain the tasking

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<sup>254</sup> Martin Van Creveld, "The Rise and Fall of Airpower," *Military History Quarterly* (Spring 1996), 81.

<sup>255</sup> TRADOC, "UE Concept," 11.

authority to “pull” GAW assets from an Objective Force Corps support mission if the situation dictates (arrangement would be similar to Marine OMNIBUS agreement on use of Marine air assets). This concept would improve airpower responsiveness, integration, and level of training with ground forces and better align joint doctrine with the expected operational environment of 2015. CAS/BAS airpower would be treated as a separate maneuver element (as Army aviation is today) and have the potential for operational as well as tactical effects on the battlefield.

## **SUMMARY**

With the on-going debates and contentious history of close air support, will CAS be where needed and when to support Objective Force operations in 2015? The answer to this question is no unless the definition, doctrine, and integration of CAS with the ground component scheme of maneuver is improved. To reach this conclusion, this monograph examined whether the expected joint doctrine for close air support in 2015 would match the capabilities and requirements of the Army’s Objective Force. The analysis focused on determining how CAS is defined, how it is used, and how it is controlled.

The historical analysis demonstrated that given sufficient time, the services will eventually work out deficiencies in existing doctrine. Unfortunately, except for Desert Storm, the Services were ill prepared to conduct close air support. The Army and Air Force entered the Korean and Vietnamese conflicts believing that airpower was not needed within ground forces indirect fires ranges. This assumption quickly proved false. During the Korean and Vietnam conflicts, CAS was used extensively to augment the ground commander’s organic weapons fires in close proximity to troops. By Desert Storm, the majority of CAS sorties were used beyond artillery ranges to shape enemy formations that could have near-term effects on the close battle.

The Air Force has continually advocated the centralized control of airpower under a single air manager since before World War II. It was not until Desert Storm that fixed wing CAS aircraft were under some type of control by a single air manager. Even then, Army and Marine

helicopters continued to remain under the control of their parent Service. Today, the Joint Force Air Component Commander (JFACC) is the focal point for the command and control of joint air operations. The JFC normally assigns the role of JFACC to the component commander having the preponderance of air assets and the capability to plan, task, and control joint air operations. Only the JFC has authority to reassign, redirect, or reallocate a component's direct support air capabilities/forces.<sup>256</sup>

The Tactical Air Control Party (TACP) is the primary organization/unit that provides terminal guidance and control for CAS aircraft. As the battlefield has increased in sized and become non-linear, the ability of ground based terminal air controllers to effectively control CAS has decreased. As a result, the majority of CAS missions are controlled by airborne forward air controllers, FAC(A). The non-linear and non-contiguous Units of Action Red Zone battles in 2015 will require Army personnel to be trained in the employment and control of fixed and rotary wing CAS when Air Force TACPs are not available.

A major conclusion of this monograph is that the definition of CAS must account for the use of airpower in close proximity to troops as well as to shape near-term enemy forces that are outside the range of the preponderance of ground weapon systems. The creation of the term Battlefield Air Support, with CAS and BI its subcomponents, has been recommended by the Joint Firepower Control Course. This concept decreases the confusion on how to employ and control airpower in support of ground operations and more closely aligns joint doctrine with current reality. This concept should be codified into joint doctrine.

Three potential courses of action to improve the doctrine and integration of CAS in 2015 were presented. The first COA focused on modifications to existing doctrine, establishing habitual relationships between Army and Air Force units, and improving CAS training /use for rotary wing aircraft. The second COA advocated the Army assuming the responsibility for CAS

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<sup>256</sup> Joint Chiefs of Staff, *JP 1-02 DoD Dictionary of Military and Associated Terms* (Washington, D.C.: US Government Printing Office, 1997), 286.

missions within ground based indirect artillery ranges. The final COA recommended the integration of fixed wing aircraft units into Objective Force Division Air-Ground Task Forces. These fixed and rotary wing units would be tasked organized into Ground Attack Wings (GAWs) which would be commanded by an airmen or aviator.

The doctrine, equipment, and training for Objective Force operations are being developed today. In the area of close air support, the current joint doctrine is disconnected from what will be required for success on the battlefield in 2015. We still have time to bring Joint and Objective Force doctrine into alignment. In May 1984, the Army and Air Force signed a memo of agreement which directed that the USAF Tactical Air Command and Army TRADOC jointly provide doctrinal guidance for the conduct of the AirLand Battle. Even with this level of cooperation, the services continued to disagree on the allocation and control of air assets which were in direct support of ground operations. Is a similar cooperative effort being conducted between the Air Force and Army today? If not, there is little hope that airpower will be where and when it's needed on the Objective Force battlefield of 2015.

# BIBLIOGRAPHY

## BOOKS

- Allen, Mathew. Military Helicopter Doctrine of the Major Powers, 1945-1992: Decisions about Air-Land Warfare. Imprint Westport, Greenwood, Connecticut, 1993.
- Cardwell, Thomas A. III. Airland Combat: An Organization for Joint Warfare. Maxwell AFB, AL: Air University Press, 1992.
- Cole, Alice C. The Department of Defense: Documents on Establishment and Organization 1944-78. Washington D.C.: Pegamon Brassey's International Defense, 1985.
- Cooling, Franklin B. Case Studies in the Development of Close Air Support. Office of Air Force History, US Air Force, 1990.
- Futrell, Robert F. Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force 1914-1960. vol 1. Maxwell Air Force Base, AL., Air University Press, December 1989.
- Futrell, Robert F. Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force 1961-1984. vol. 2. Maxwell AFB, AL: Air University Press, 1989.
- Futrell, Robert F. The United States Air Force in Korea 1950-1953. Washington D.C.: Office of Air Force History, 1983.
- Huntington, Samuel P. The Clash of Civilizations. New York, Simon & Schuster, 1997.
- Kaplan, Robert D. The Coming Anarchy. New York, Random House, 2000.
- Kinnard, Brigadier General Douglas. The War Managers. Hanover, NH: University Press of New England, 1977.
- Lester, Major Gary R. Mosquitoes to Wolves: The Evolution of the Airborne Forward Air Controller. Maxwell Air Force Base, AL: Air University Press, 1997.
- Momyer, William M. Air Power in Three Wars. Washington, D.C.: US Government Printing Office, 1978.
- O'Hanlon, Michael. Technological Change and the Future of Warfare. Washington, D.C.: Brookings Institution Press, 2000.
- Scales, MG Robert H. Future Warfare: An Anthology. Carlisle Barracks, Pennsylvania: U.S. Army War College, May 1999.
- Swain, Richard M. Lucky War, Third Army in Desert Storm. Fort Leavenworth, KS: US Army Command and General Staff College Press, 1994.
- Taylor, J.H. Close Air Support: Armed Helicopters and Ground Attack Aircraft. Mechanicsburg, PA: Greenhill Books, 1995.

- Tilford, Earl H. Setup: What the Air Force did in Vietnam and Why. Maxwell AFB, AL: Air University Press, 1991.
- Turabian, Kate L. A Manual for Writers of Term Papers, Theses, and Dissertations. 6<sup>th</sup> ed. Chicago: University of Chicago Press, 1996.
- Warden, John A III, The Air Campaign: Planning for Combat. Lincoln, NE: toExcel Press, 2000.
- Watson, Bruce and Bruce George. Military Lessons of the Gulf War. Novato, CA: Presidio Press, 1991.
- Winnefeld, James A. and Dana J. Johnson, Joint Air Operations, Pursuit of Unity of Command and Control, 1942-1991. Annapolis, MD: Naval Institute Press, 1993.

## ARTICLES

- Boatman, John. "USA Redefines CAS Doctrine for a New Era of Warfare," *Jane's Defense Weekly*. 12 December, 1992.
- Buis, COL Gary. "Air Warrior / National Training Center: Now versus Yesterday," *Air-Land-Sea Bulletin* 96-3. Langley AFB VA: Government Printing Office, 1996.
- Coniglio, Sergio. "Close Air Support Operations and Debate." *Military Technology* (October, 1993): 30-31.
- Den Beste, Edwin J. and Servold, Gary M. "CAS Integration Lessons," Online Source: *Counterland Close Battle Library, Air-Ground Operations School (AGOS)*, <http://www.nellis.af.mil/agos/lib.html>.
- Duncan, Robert E. "Responsive Air Support," *Air Force Magazine* (February, 1993): 74-78.
- Fedorchak, Scott A. "Close Air Support: Repeating the Past, Again," *Airpower Journal*. (Spring 1994, Vol 8, Issue 1): 22-34.
- Fogelman, General Ronald R. "Making the Most of Air Power." *Field Artillery* (Sep-Oct 1996).
- Halperin, Morton H. and David Halperin. "Rewriting the Key West Accord," in *Reorganizing America's Defense: Leadership in Peace and War*, ed. Robert J. Art, Vincent Davis and Samuel P. Huntington. Washington D.C.: Pergamon Brassey's International Defense, 1985.
- Hayward, George. "When the Army's 82<sup>nd</sup> Airborne Needs Fire from the Sky, it Looks to the 14<sup>th</sup> AGOS to Call the Shots." *Airman*. (May 1999): 44-49.
- Jones, Brian W. "Close Air Support: A Doctrinal Disconnect." *Airpower Journal*. (Winter 1992, Vol 6, Issue 4): 60-71.
- Keithly, David M. "Revamping Close Air Support," *Military Review* (March-April 2000): 14-23.
- Raines, Edgar F. "When There was Common Ground in the Air: Army-Air Force Cooperation." *Army* (March 1995): 24-31.

- Smith, Jeffrey A. "Who Can Control a CAS Mission?" *Marine Corps Gazette* (May 1997): 23.
- Starry, General. "Extending the Battlefield." *Military Review* (March 1981): 31-50.
- Sweetman, Bill. "Close Air Support: Fighters High, Helicopters Low." *International Defense Review* (November, 1992): 1077-1081.
- Van Creveld, Martin. "The Rise and Fall of Airpower." *Military History Quarterly* (Spring 1996).

## GOVERNMENT PUBLICATIONS

- Center for Army Lessons Learned. *CALL 01-07 Newsletter*: "Air-Ground Integration (CPT Robert Ault, NTC)." Fort Leavenworth, KS: <http://call.army.mil/products/newsletters/01-7/01-7ch3.htm>. accessed 24 August, 2001.
- Center for Army Lessons Learned. *CALL 98-13 Newsletter*: "Close Air Support (MAJ Don Barnett, NTC)." Fort Leavenworth, KS: CALL Newsletter, July 1998.
- Center for Army Lessons Learned. *Combat Training Centers (CTC) Quarterly Bulletin No. 95-1*: "Joint Close Air Support Joint Test and Evaluation Interim Report (LTC Bryan Campbell, Deputy Director JCAS JT &E)." Fort Leavenworth, KS: Online Source: <http://call.army.mil/products/trngctr/tq2-01/cambell.htm>
- Center for Army Lessons Learned. *Combat Training Centers (CTC) Quarterly Bulletin March-April 95*: "Using Attack Helicopters (1LT Shaun Greene)" Fort Leavenworth, KS: Online Source: [http://call.army.mil/products/ctc\\_bullet/infantry/marapr95/helicopter.htm](http://call.army.mil/products/ctc_bullet/infantry/marapr95/helicopter.htm).
- Center for Army Lessons Learned: *CALL Newsletter 90-5*: "Section XVIII: Close Air Support and Army Aviation Require Well Designed Control Measures." Fort Leavenworth, KS: Online Source: <http://call.army.mil/products/newsletters/90-5/ch18.htm>.
- Center for Army Lessons Learned: *CALL Newsletter Jan-Feb 00*: "UAV Lessons Learned from Operation ALLIED FORCE." Fort Leavenworth, KS: Online Source: <http://call.army.mil/products/nftf/janfeb00/part1.htm>.
- Headquarters, Department of the Air Force, *AFDD 2-1.3 Counterland*. Washington, D.C.: Government Printing Office, 1999.
- Headquarters, Department of the Army, *FM 31-35 Air Ground Operations*. 13 August 1946.
- Headquarters, Department of the Army, *FM 100-15 Corps Operations*. Washington, D.C.: United States Government Printing Office, 1996.
- Headquarters, Department of the Army, *FM 100-5 Operations*. Washington, D.C.: United States Government Printing Office, June 1993.
- Headquarters, Department of the Army, *FM 100-7 Decisive Force: The Army in Theater Operations*. Washington, D.C.: United States Government Printing Office, May 1995.

Headquarters, Department of the Army, *FM 101-5-1 Operational Terms and Graphics*. Washington, D.C.: United States Government Printing Office, 1997.

Headquarters, Department of the Army, *FM 1-100 Army Aviation*. Washington, D.C.: United States Government Printing Office, 1997.

Headquarters, Department of the Army, *FM 3.0: Operations*. Washington, D.C.: United States Government Printing Office, June 2001.

Headquarters, Department of the Army, *FM 6-20 Fire Support for Corps and Division Operations*. Washington, D.C.: United States Government Printing Office, 1989.

Headquarters, Department of the Army, *FM 6-20 Fire Support in Combined Arms Operations*, Washington, D.C.: United States Government Printing Office, 1977.

Headquarters, Department of the Army, *FM 6-20-1 Field Artillery Tactics*, Washington, D.C.: United States Government Printing Office, 1961.

Headquarters, Department of the Army, *FM 90-21 JAAT Multiservice Procedures form Joint Air Attack Team Operations*. Washington, D.C.: US Government Printing Office, 1998.

Headquarters, Department of the Army, *United States Army Posture Statement for FY01*. Washington, D.C.: February 2000.

Headquarters, United States Air Force, *AFDD 1 Air Force Basic Doctrine*. Washington, D.C.: Government Printing Office, 1997.

Headquarters, United States Air Force. *AFI 13-102 Air Support Operations Center (ASOC) and Tactical Air Control Party (TACP) Training and Evaluation Procedures*. Online Source: <http://afpubs.hq.af.mil>, 1Sep 1996; Accessed 20 September, 2001.

Headquarters, United States Air Force. *FY 2001 Air Force President's Budget*. Online Source: <http://www.saffm.hq.af.mil/FMB/pb2001/afrom.html>. Accessed 20 September 2001.

Headquarters, United States Army Training and Doctrine Command. *Army Transformation Wargame 2001*. Carlisle Barracks, PA: U.S. Army War College, 22-27 April 2001.

Headquarters, United States Army Training and Doctrine Command. *Objective Force Unit of Employment Draft Concept Paper*. Fort Monroe, VA: July 2001.

Headquarters, United States Marine Corps. *MAWTS-1 Aviation Combat Element (ACE) MOUT Manual*. ed. IX., MCAS Yuma, AZ: 1 Sept 2000.

Headquarters, United States Marine Corps. *MCWP 3-23.1 Close Air Support*. Washington D.C.: United States Government Printing Office, July 1998.

Joint Chiefs of Staff, Office of the Chairman Joint Chiefs of Staff. *Joint Publication 3-09.3 JTTP for Close Air Support (DRAFT)*. To be published in 2003.

Joint Chiefs of Staff, Office of the Chairman Joint Chiefs of Staff, *Joint Publication 1-02 Joint Terms and Definitions*. Washington, D.C., US Government Printing Office , 1995.



- Joint Chiefs of Staff, Office of the Chairman Joint Chiefs of Staff, *Joint Publication 3-09.3 JTTP for Close Air Support (CAS)*. Washington, D.C.: US Government Printing Office, 1995.
- Joint Chiefs of Staff, *Report on the Roles, Missions, and Functions of the Armed Forces of the United States*. Washington, D.C.: United States Government Printing Office, 1993.
- Joint Chiefs of Staff. "Concept for Future Joint Operations-Expanding Joint Vision 2010." *Joint Electronic Library*. OC Incorporated, May 1997.
- Joint Chiefs of Staff. "Global Engagement: A Vision for the 21<sup>st</sup> Century Air Force." *Joint Electronic Library*. OC Incorporated, May 1997.
- Joint Chiefs of Staff. Office of the Chairman Joint Chiefs of Staff. *JP 0-02 Unified Action Armed Forces*. Washington D.C.: US Government Printing Office, 1995.
- U.S. Air Force, *Air Combat Command*, "A-10/OA-10 Thunderbolt II General Characteristics." Online Source: <http://ehostvgw6.epnet.com>.
- U.S. Air Force, Air Ground Operations School, Nellis AFB. "Air Warrior I and II." *Counterland Close Battle Library*. Online Source: <http://nellis.af.mil/agos/lib.html>, 21 September 1998.
- U.S. Army TRADOC Deputy Chief of Staff for Doctrine, "Concepts for the Objective Force." *Army White paper on the Objective Force*. Fort Monroe, VA: US Army Training and Doctrine Command, Nov 2001.
- U.S. Army TRADOC Deputy Chief of Staff for Doctrine, "Objective Force Unit of Employment Concept." *Abbreviated Text for Objective Force Seminar Wargame*. US Army TRADOC, 17-19 July 2001.
- U.S. Army TRADOC Deputy Chief of Staff for Doctrine, *Draft TRADOC Pamphlet 525-3-0 United States Objective Force Operational and Organizational Concept*. Fort Monroe, VA: US Army Training and Doctrine Command, Nov 2001.
- U.S. Army TRADOC Deputy Chief of Staff for Intelligence, *The Future Operational Environment*. Fort Monroe, VA: US Army Training and Doctrine Command, May 2001.
- U.S. Army Training and Doctrine Command. *Looking to the Future: TRADOC's 20<sup>th</sup> Anniversary Seminar on Future Warfare*. Fort Monroe, VA: July 1993.
- U.S. Army, Battle Command Training Program (BCTP). *Air Integration*. Seminar briefing to SAMS students, Feb 2002.
- U.S. Army, Battle Command Training Program (BCTP). *Warfighter Exercise Design*. Seminar briefing to SAMS Students, 8 Feb 2002.
- U.S. Army, Battle Command Training Program (BCTP). *Warfighter Trends for 1999 & 2001*, briefing posted to BCTP web site: <http://bctp.leavenworth.army.mil/BCTPPerceptions.htm>.
- U.S. Army Combined Arms Center, *Combined Arms Doctrine Directorate Library*. Online source available from <http://www-cgsc.army.mil/cdd/ADMIN/doc-lib.htm>. Accessed 20 Feb 2002.
- U.S. Army Training and Doctrine Command. *Objective Force Capabilities Briefing*. Presentation to SAMS Students, Sep 2001.

U.S. Army TSM Comanche, *RAH-66 Comanche Operational Requirements Document*. Online Source available from: <http://155.147.98.10/tsmc/noord.htm>. Accessed 20 February, 2002.

## STUDIES AND REPORTS

Air Land Sea Application Center, "CAS Lessons Learned at the Combat Training Centers," *Air Land Sea Application Center 94-1*. Langley AFB VA: Government Printing Office, 1994.

Army Research Institute (ARI). *Integrated Task List for the Air-Ground Training Feedback System*. Online Source available from <http://www.ari.army.mil/>. Aug 93: Accessed 15 January, 2002.

Carmichael, COL Bruce W. and MAJ Troy DeVine. *Stikestar 2025*. Research Paper for Air Force 2025. Maxwell Air Force Base, AL: Air University, August 1996.

Carpenter, Major Mason P. *Joint Air Operations in the Gulf War: An Allison Analysis*. Maxwell AFB, AL: Air University Press, 1995.

Combest, Michael L. *Apportionment and Tactical Airpower in Airland Battle: An Evaluation of CAS, BAI, and AI from an Operational Perspective*. Monograph. Fort Leavenworth, KS: U.S. Army Command and General Staff College, School of Advanced Military Studies, May 1987.

Costello, Peter A. III. *A Matter of Trust: Close Air Support Apportionment and Allocation for Operational Level Effects*. Thesis. Maxwell Air Force Base, AL: School of Advanced Aerospace Studies, 1997.

Eddington, Jack B. *Ground Maneuver and Air Interdiction: A Matter of Mutual Support at the Operational Level of War*. Thesis. Maxwell AFB, AL: School of Advanced Aerospace Studies, August 1994.

General Accounting Office (GAO), "Combat Airpower: Assessment of Joint Close Support Requirements and Capabilities is Needed," *Report to Congressional Committees*. Washington D.C.: US Government Printing Office, June 1996.

Gonzales, Harold T. *Tactical Air Support of Ground Forces in the Future*. Airpower Research Institute. Research Report No. AU-ARI-89-7, 1990.

Herbert, Major Paul H. *Deciding What Has to Be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations*. Leavenworth Papers Number 16. Fort Leavenworth, KS: Combat Studies Institute, 1988.

Historical Evaluation and Research Organization. *An Historical Analysis of the Effectiveness of Tactical Air Operations against and in Support of Armored Forces*. Dunn Loring, VA: Sandia Laboratories Report Contract Number 07-5874, A Division of T.N. Dupuy Associates, INC. January 1980.

Keaney, Thomas A. and Eliot A. Cohen. *Gulf War Air Power Survey (GWAPS) Summary Report*. Washington D.C.: US Government Printing Office, 1993.

- Knox, MAJ Raymond O. *The Terminal Strike Controller: The Weak Link in Close Air Support*. Monograph Leavenworth, KS: U.S. Army Command and General Staff College, School of Advanced Military Studies, November 1988.
- Krepinevich, Andrew F. Jr. *Missed Opportunities: An Assessment of the Roles and Missions Commission Report*. Washington D.C.: Defense Budget Project, August 1995.
- Laughbaum, Lt Col Kent. *Synchronizing Airpower and Firepower in the Deep Battle*, CADRE Paper. Maxwell AFB, AL: Air University Press, 1999.
- Lewis, Michael. *LTG Ned Almond, USA: A Ground Commander's Conflicting View with Airmen over CAS Doctrine and Employment*. Thesis. Maxwell AFB, AL: School of Advanced Aerospace Studies, 1997.
- Mrozek, Donald J. *Air Power and the Ground War in Vietnam: Ideas and Actions*. Thesis. Maxwell AFB, AL: Air University Press, 1988.
- New, Lt Col Terry L. *Where to Draw the Line between Air and Land Battle*. Thesis. Maxwell AFB, AL: Air University Press, 1996.
- Office of the Secretary of Defense, Joint Close Air Support Executive Steering Committee. *Coordination and Update Briefing to the Joint Requirements Oversight Council*. Washington, D.C.: Jan 2002.
- Office of the Secretary of Defense. Joint Close Air Support Joint Test and Evaluation Organization. *JCAS Interim Report Briefing to JCAS Symposium*. Quantico, VA: October 2000.
- RAND Corporation, "The Future of Warfare: Issues from the 1999 Army After Next Study Cycle," *RAND Corporation Research Project for the Department of the Army*. Washington D.C.: RAND Corporation, 2000.
- Simmons, James E. *The Attack Helicopter Battalion: Ready for the 60s or the 90s*. Monograph. Fort Leavenworth, KS: U.S. Army Command and General Staff College, School of Advanced Military Studies, March 1990.
- Skattum, MAJ Mark H. *The OA-10: How can We Best Employ it in the Airland Battle?* Monograph. Fort Leavenworth, KS: U.S. Army Command and General Staff College, School of Advanced Military Studies, July, 1989.
- U.S. Air Force, 549<sup>th</sup> Combat Training Squadron. "Training the Warrior Elite," *Air Warrior 96-09 Final Report*. Langley AFB VA: Government Printing Office, 1996.
- U.S. Air Force, Air Combat Command, *Joint Firepower Control Course Briefing to CAF Weapons and Tactics Conference*, 8 Dec 2000. Online source available from Air Combat Command Homepage (web address classified secret), SIPRNET. Accessed 20 Feb 2002.
- U.S. Air Force, Air Combat Command. *Concept of Operations for Loitering Armed Reconnaissance and Forward Air Control UAV—FAC(U)*. UAV Battlelab Briefing to CAF Weapons and Tactics Conference, December 2000. Online source available from Air Combat Command Homepage (web address classified secret), SIPRNET. Accessed 20 Feb 2002.

Unterreiner, CDR Ronald J. and MAJ Jeffrey Brelsford. *Close Air Support (CAS) in 2025: Computer, Lead's in Hot*. Research Paper for Air Force 2025. Maxwell Air Force Base, AL: Air University, August 1996.

Vector Research, *The 21<sup>st</sup> Century Army: Report of the Roles, Missions, and Functions of the Army in an Age of Information and Uncertainty*. Research Report for the Office of the Army Deputy Chief of Staff for Operations and Plans, contract number MDA903-91-D-0029. Ann Arbor, MI: 1995.

Weber, Edward V. *The Future of Fixed-Wing Close Air Support: Does the Army Need It to Fight?* Monograph. Fort Leavenworth, KS: U.S. Army Command and General Staff College, School of Advanced Military Studies, December 1997.

Winnefeld, James A., Preston Niblack, and Dana J. Johnson. *A League of Airmen: U.S. Air Power in the Gulf War*. Santa Monica, CA: RAND, 1994.

## INTERVIEWS

Frazee, COL Phillip, Director of USAF Doctrine Center, interview with author, tape recording, Fort Leavenworth KS, 13 March 2002.

Grey, MAJ Scott, Air Force A-10 Pilot, interview by author, tape recording, Fort Leavenworth KS, 28 Feb 2002.